Digital Digest

Vol. 3 No. 5 **Devoted entirely to Digital Amateur Radio Communications** September/October, 1990

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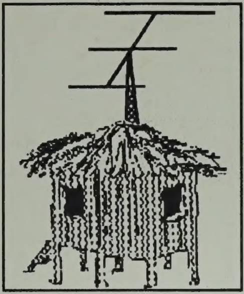

From The Publisher's Shack

Yes, this issue is late! Can't even blame it on our venerable postal service or the crisis in the Middle East.

Seems that several of our DD columnists, as well as "Your's truly," have found ourselves in a time squeeze. Adding insult to injury, Murphy has been lurking in our halls and offices. Seems whatever could go wrong, did this past month. I can't remember a time when all at once it seems that virtually every piece of equipment from stat camera's to typesetters to computers has suffered from some form of malaise. All the consequences of which has been an extremely late Digital Digest.

Murphy, hopefully has been eradicated from the premises and will not return for the foreseeable future. We thank everyone for being patient. Several inquiries we received of concern for where the Digest was were, in a sense, reassuring. It's nice to know that you're missed. We, however, do not intend to make this a general practice of being late with future issues.

As a point of observation, since the Middle East crisis, it seems that there has been a run on the purchases of portable short-wave receivers. A local check of the various dealers of such gear found many of them in short or depleted supply. Whether its interest in getting news first-hand from the Middle East or just coincidence, the upsurge in short-wave interest could be an added shot-in-the-arm for Amateur Radio. In this issue we have included a review on one of the popular short-wave portables. Wonder how one of these portables might work in the digital modes interfaced with a computer and transmitter? Perhaps, one of you might be operating with such a system and would care to report on its operation.

We have had requests for more information on DSP & TCPIP. If any readers have information to contribute along these lines we would appreciate the information to share with the rest of the digital community. Just drop us a note via snail mail, a fax, or E-mail on these or any other digital subjects - modes or applications. The more information we can share, the more fun and pleasurable our digital communications will be.

Till next issue, 73 . . . Tom / WA8DXD

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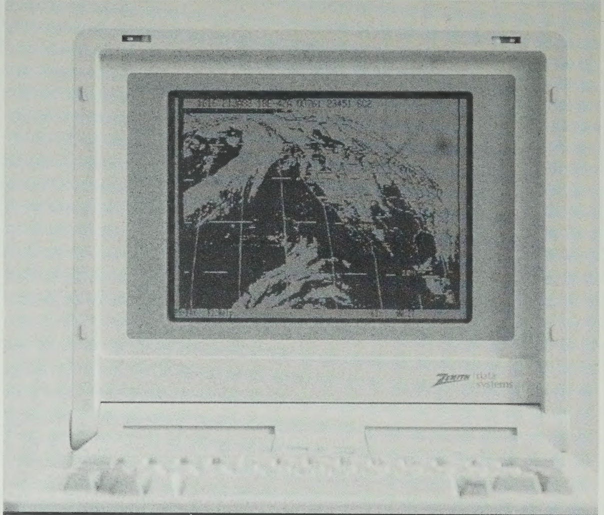
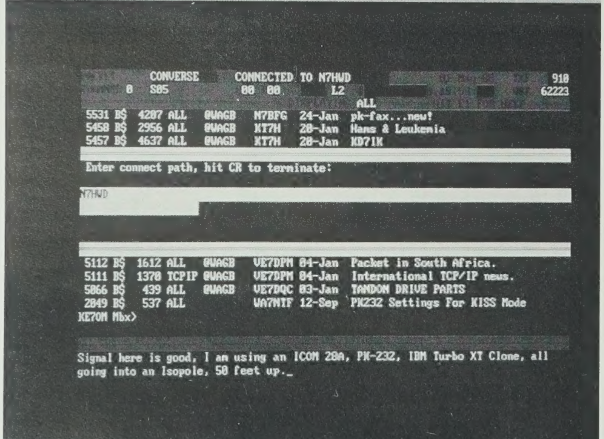
AEA'S NEW PK-232MBX With PakMail™





```
            CONVERSE        CONNECTED TO N7HWD                                910
          0   S05             00  00        L2                              62223
                                             ALL
 5531 B$  4207 ALL    @WAGB   N7BFG  24-Jan  pk-fax...new!
 5458 B$  2956 ALL    @WAGB   KT7H   20-Jan  Hams & Leukemia
 5457 B$  4637 ALL    @WAGB   KT7H   20-Jan  KD7IK

 Enter connect path, hit CR to terminate:

N7HWD


 5112 B$  1612 ALL    @WAGB   VE7DPM 04-Jan  Packet in South Africa.
 5111 B$  1370 TCPIP  @WAGB   VE7DPM 04-Jan  International TCP/IP news.
 5066 B$   439 ALL    @WAGB   VE7DQC 03-Jan  TANDOM DRIVE PARTS
 2049 B$   537 ALL            WA7NIF 12-Sep  PK232 Settings For KISS Mode
KE7OM Mbx>

Signal here is good, I am using an ICOM 28A, PK-232, IBM Turbo XT Clone, all
going into an Isopole, 50 feet up._
```

Now AEA's popular PK-232 multi-mode data controller has new features you've been asking for...PakMail™ Mailbox with selectable third-party traffic, seven-character AMTOR (CCIR R.625) call identity, TDM (Time Division Multiplex) receiving for SWL's, and Prioritized Acknowledgement (ACK) protocol for improved packet performance. Compatible with almost every computer or asynchronous data terminal, you can enjoy the full spectrum of amateur digital communications with AEA's new PK-232MBX.

All Operating Modes. The PK-232MBX includes all authorized amateur digital modes available today...Morse, Baudot, ASCII, AMTOR/SITOR 476 and 625, Packet, WEFAX receive and transmit, as well as commercial standard NAVTEX automated marine information services.

Superior Modem. An eight-pole Chebyshev bandpass filter limiter- discriminator modem improves the signal-to-noise ratio at the detector and virtually eliminates interference from adjacent signals. System performance has been proven superior to that of PLL modems designed for telephone line services.

PakMail.™ PakMail™ mailbox with selective control of third-party traffic is now a standard feature. Your friends can now leave you messages around the clock. Your local full-service BBS can automatically forward your messages directly to your PK-232MBX.

WEFAX Transmission and Reception. AEA brought you the first multi-mode controller to send and receive WEFAX (weather facsimile) charts. The PK-232MBX directly supports the widest range of printers on the market using the optional RS-232/printer cable.

Host Mode. Only AEA provides the type of full-featured Host Mode preferred by many professional programmers for efficient control of the PK-232MBX. AEA's Host Mode programs include PC-Pakratt with FAX for the IBM PC's and compatible MS-DOS computers, COM- Pakratt with FAX for the Commodore C-64 and C-128, and now MacRATT with FAX for the Apple Mac-Intosh.

Two Radio Ports. Independent radio connection ports allow convenient, interchangeable all-mode operation regardless of port selection. You can connect two VHF/UHF radios, an HF and a VHF/UHF radio, or two HF radios, selectable by a front-panel switch.

Signal Analysis. The PK-232MBX's internal software features AEA's exclusive SIAM (Signal Identification and Acquisition Mode). The PK-232MBX automatically identifies Baudot, ASCII, AMTOR/SITOR and TDM signals, then measures signal speed and polarity. A simple "OK" command automatically switches the PK-232MBX to the recognized mode and starts the data display.

PakMail™ Upgrade Kit. The easily-installed PakMail™ upgrade kit includes a plug-in board and new software EPROMs, and is fully compatible with all existing PK-232's. Please contact factory for details.

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The DIGIPEATER

News & Information communicated from various sources.

Radio Schools's Gordon West, WB6N0A...

is now offering a free weekend of instructor and elmer training in the latest classroom techniques for teaching amateur radio. Instructors attending the weekend seminar will also learn new marketing skills and where they can purchase books, keys and tapes at deep discounts, as well as how to receive gift certificates from manufacturers. A portion of the time will be devoted to explaining the benefis and requirements of state resale licenses and West will also present an in-depth look at the new special testing procedures for the disabled as just recently defined in 29 USC 706 (15)(a). For further information, write Gordon West at 2124 College Drive, Costa Mesa, CA 92626, or call (714) 549-5000; fax (714) 434-0666.

Pirated Version's of AMSAT Software...

are appearing on BBSs nationwide, and amateur radio's space communications development organization wants the piracy to stop. According to a press release, a number of BBS sysops have called AMSAT headquarters asking if Instant Track was now being offered as shareware or is in the public domain. It seems that there are people who are uploading the software into BBSs from which anyone who dials in can download a "free" copy. In many cases the copyright information is still intact when running the program.

None of the tracking software which AMSAT offers is, in fact, shareware or in the public domain. The distribution of software is one of the major sources of cash necessary for the funding of the construction, launch and operation of AMSAT's sarellires. These pirared versions of the software represent a serious threat to futwe spacecraft development. Please inform the sysop immediately on any system youfindpirated AMSAT software. It is not unusual for sysops to miss inspecting some of the thousands of files left on their boards.

Source: Westlink Report: 9/28/90

Warning: Do Not QSO Kuwait...

Under no circumstances should you hold a QSO with any station claiming to be operating from Kuwait - it could cost the Kuwaiti amateur his freedom or his life. This is the gist of a message issued to all amateur operators worldwide on September 2nd by the Radio Society of Great Britain via its GB2RS broadcasts. The RSGB says that it received the request to issue the bulletin from the Kuwaiti Embassy in London.

The text of the news release says that it is important that no amateur anywhere in the world attempt to enter into conversation with any Kuwaiti amateur, or any amateur claiming to be on the air from Kuwait. This is for the Kuwaiti amateur's safety, not yours, but the consulate asked that you NOT CALL or contact Kuwaiti stations, no matter what the circumstance may be.

It is not known if the legitimate Kuwaiti ambassador to the United States has made a similar request to the FCC or ARRL. With tensions very high in the area, it might be best if hams took a back seat and let President Bush and other world leaders work things out first. Tnx Newsline.

Source: Westlink Report: 9/28/90

Balloon Over Florida...

Skybeacon II was a complete success. The flight of Stratonet Florida's balloon carrying a ham radio station took place on Saturday, September 15th.

The first of the two part package consisted of a I watt, two meter FM transmitter operating on 144.34 MHz sending CW identification and telemetry signals. The other part of the payload was a fast-scan amateur television transmitter on 434 MHz sending back live pictures from a CCD camera.

The launch took place from the Deland, Florida airport, landing 15 miles away in the Spruce Creek Swamp near Samsula. The flight lasted about 2 hours, 36 minutes, and the two meter signal was heard as far away as Asheville, North Carolina.

The rate of ascent was 920 feet per minute while the rate of decent was 1706 feet per minute. Tnx N4WKQ.

Source: Westlink Report: 9/28/90

If you have news or information of interest to the digital amateur radio community, please let us know!

SAREX Packet Hints...

You learn very quickly when venturing into the world of packet radio that unless you use the correct callsign when attempting to connect to another packet station, you won't get too far. Such is the case with the packet operation on SAREX. Several publications reported earlier this year that the SSID for the SAREX packet Robot would be = 1 (i.e. WA4SJR-1). Tom Clark, W3IWI, reports that both the HK21 Robot TNC and the operational software for the GRID laptop computer have the calls defaulted to WA4SIR (SSW = 0) and that call should be used unless, for some unanticipated reason, the defaults are over-ridden. Tom says that the best advice is for you to monitor the downlink signals from STS-35 and use whatever call you see on the downlink. The Robot TNC code uses only one SSID at a time.

Because the WA4SIR SAREX Robot will be bombarded with signals from tens or hundreds of ground-based users when STS-35 is flying over populated areas, it is not possible for the Robot TNC and radio to use normal half-duplex packet procedures because the "carrier detect" signal will simply never drop! The Robot will be running in a modified full-duplex mode. When the Robot copies a valid packet frame, or when it is time to send a beacon, the data to be sent is put into a buffer and a timer, called the "FUDtimer," is started. The Robot firmware then queues all other outgoing transmissions in the buffer until the FUDtimer expires 3 seconds later, and all downlink frames in the queue are sent in one long transmission. You may discover that the response time while running in this mode is sluggish when compared to normal terrestrial packet operations.

Since the SAREX hand-held radio cannot receive when it is transmitting, users should insure that they remain silent and listen when the shuttle is transmitting. In other words, DO NOT RUN FULL DUPLEX ON THE GROUND! Leave your TNC in half-duplex mode (FULLDUP off) with CD active just as you do for normal VHF packet operations.

You should be careful with the setting of two of your TNC's timers: "DWAIT" and "FRACK." DWAIT is the time interval after your carrier detect light goes out and before your transmitter turns on. You want to make sure your connects requests and ACKs are contained in the 3 second FUDtimer window. If everybody runs

(cont'd page 32)

Digital Digest-PACKET

by Lynn W. Taylor, WB6UUT
463 Myrtle Street • Laguna Beach, CA 92651

Packet Radio Etiquette

Along with any new method of communications comes a new form of etiquette. The word "Hello" entered the English language with the telephone, and the amateur term "73" came from CW ops (commercial and amateur) as a shorthand personal greeting that could easily be sent along with other traffic.

The purpose of etiquette is simple: if you offend someone, they will quit paying attention to what you have to say. If the tone of your message is friendly and courteous, they will read and consider whatever you have to offer.

On the telephone, or on the local repeater, or on 20 meter CW, I'm sure everyone reading this knows what is proper, friendly behavior, or at least knows when they are being rude on purpose.

On Packet, things are a little different, I think mostly because we haven't been running packet long enough for a "Packet Radio Etiquette" to become second nature. To help this process along, I'd like to offer the following guidelines:

Keyboard to keyboard:

We have the fewest problems operating keyboard to keyboard because this is the most like other familiar modes: we are actually talking to someone else in "real time," so they can respond to what we're saying. This "conversational" nature makes us forget sometimes that the "tone of voice" doesn't always come through.

When talking to someone "real time," try to leave clues to fill in for the missing "tone." For example, in our area, <grin> is often added at the end of a statement to mean "I'm kidding."

"Emoticons," or "emotional icons" are also showing up here in the local area: to read these, just imagine what they look like turned 90 degrees. These three or four character "faces" express a wide range of emotions:

Expression	Emotion
Smile or grin	:-)
Smile and wink	;-)
Frown	:-(
"Oh no!"	:-O

I'm sure you can dream up some more.

Other common abbreviations: FWIW: for what it's worth, OTOH: on the other hand, BTW: by the way, and my favorite, IMHO: in my humble opinion.

CW abbreviations are also handy, such as the universal "73" which we all understand, and at least the more common "Q-signals" such as QTH.

It is of course only good manners to make sure the other station understands what these emoticons and abbreviations mean when you use them. "Leaving the reader in the dust" obscures communication, it does not enhance communication.

When in doubt, which is worse: assuming the other guy has a strange sense of humor, or assuming the other guy is a jerk trying to make you look like an idiot? The first is most likely true, but it seems to be human nature to assume the worst. Let's try to give everyone the benefit of the doubt.

Another important area is formatting. Why should you make your reader deal with words split at the end of the line? Try and hit return on every single line so the reader can pay attention to what you are saying and not waste time figuring out where one word ends and the next begins.

Another reason for hitting return on each line is to help Packet Radio operate as a full duplex environment. If you let PACLEN cause packets to be sent, I'll probably get a full line plus part of a second. If I have some comment to send to you, I have the choice of waiting for you to finish what your are saying, or typing in the middle of your line. Hitting return on each line, combined with the FLOW command in the TNC, provides a clean, line by line environment. Some programs, like PacketGOLD, provide this kind of environment automatically.

ALSO, I WOULD REALLY APPRECIATE IF IF EVERYONE WHO CAN USE UPPER AND LOWER CASE WOULD QUIT SHOUTING. IT LOOKS LIKE I'M YELLING AT YOU HERE ON THE PRINTED PAGE, AND IT LOOKS LIKE YOU ARE YELLING AT ME WHEN IT APPEARS ON MY SCREEN. Use all caps when you really are shouting, not all the time.

What is right at the end of a QSO? On the telephone (or the local repeater), everyone says "oops, gotta run" and then lets the other person say "bye" before they go. On packet, some people say "73" and then immediately disconnect -- usually just about the time I'm about to finish the most eloquent and well thought out statement I've ever made in my entire life. Of course, this "brilliant" thought now goes out as a UI frame, rather than to the intended recipient.

If you really have to run, say "oops, I've gotta run – you disconnect and I'll read your response later" -- and read their response later. If you aren't in that big of a hurry, pass on your 73, then let the other guy finish, pass on his parting comments, then disconnect.

Disconnecting before then is the same as the telephone practice of hanging up on someone.

Finally, is there any need for prosigns on Packet? If you hit return on each line, there is no need to wait for one "transmission" to finish before starting your response, so there is no need to signal the end of your transmissions.

On the Bulletin Boards:

One of the best, and the worst, things about the BBS network is the ability to send messages to everyone in the entire U.S. with practically no effort at all. This of course makes ARRL Bulletins, AMSAT news, Space Shuttle status and the like widely available.

It also makes it possible for someone to send messages to EVERYONE EVERYWHERE to expound (at length) on whatever is bothering them this week. Do I really need to know what someone thinks about how he was treated by the local ham store? Is this even appropriate?

It is much too easy to fire off a message to ALL @ GALAXY before you have even decided what you think on a given issue.

I've made it a practice to wait at least 24 hours before responding to any message if the response is not purely factual or informative.

Harsh words on Packet leave a bad impression. Harsh words in a message to ALL @ ALLUS can leave a bad impression of you and your operation worldwide.

One recent bulletin to ALL @ ALLUS eloquently makes several comments about SALE type messages. It's fine to advertise your surplus gear in bulletins on the BBS system.

When you send messages advertising items for sale, please use the subject to tell something about what you are selling. There are dozens of messages that say "for sale" as the subject, and I have to read the message to find out if the sender is selling something I might be interested in buying. If the subject said "Moonbounce station for sale" I'd know immediately that I don't need to read the message because I'm not interested in EME communications right now. If it says "220 MHz transceiver" I'll read it, that's something I'm looking for.

It is perfectly acceptable under the current rules to list the price of any item you are selling, and to advertise any items which are used in an amateur station, provided that you are not engaged in the regular business of selling that particular type of item.

Deceptive subjects are also poor practice. I recently called up a message which I thought was going to tell me something interesting about the space program, and instead read about how the money could be better spent (in the opinion of the sender) on Social Security.

Reading messages from BBSes use network time, good subjects help the right people find your message, and keep those who aren't interested in your message from wasting network time.

Personal attacks have no place in Amateur Radio, and this goes doubly so for the BBS network, where such attacks can (and are) widely circulated.

Kinder and Gentler parameters:

In closing, let me remind everyone that using p-Persitence, running low values for PERSIST or high values for DWAIT during file transfers and on BBS systems which generate a lot of traffic, and in general allowing time for everyone to enjoy the network is the best practice of all.

If you have news or information of interest to the digital amateur radio community, please let us know!

Interflex Systems Design Introduces Packet-GOLD

Packet-GOLD Features:

- True multi-connect software: Easily handle up to 10 sessions simultaneously. No confusion, no lines interleaving, no need for Switchchar approach, just push one function key to change from QSO to QSO. You can be receiving a file or message from a BBS while connecting to a distant node, while talking to a nearby friend while sending a CQ while monitoring the channel.

And its VERY easy to do!

- Full channel monitoring: Separate screen monitors every frame your TNC can decode. No more guessing what's going on.

- Binary File Transfer: Any file type (.EXE,.ARC, .COM, .ZIP etc) can be sent or received with other Packet PLUS users. You can also chat on the same channel during a file transfer.

- Text File Transfer: Send "brag tape" or any other text file to any other station.

- Point and Shoot operation: Selecting files for transfer requires one function key, then highlight the file and push the Enter key. This technique is also used to change several TNC parameters that you store in text editable .TNC files (Startup.tnc, shutdown.tnc, mailon.tnc, etc).

- Quick Connect list: Use the utility program to create lists of stations (bbs, friends, etc) and connect paths. Then when you want to connect, use the Point and Shoot approach, highlight the station, and Packet PLUS will establish the connect, automatically.

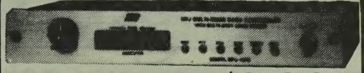
- QSO log: Keep track of names, addresses, station information for instant recall when connected.

- Name Log: When you are connected (either you initiate the connect or the other station does it) the other station's operator name appears next to the callsign. No more forgetting names, or asking yourself "Do I know this person??"

- Multi-mode support for PK-232: Packet, Baudot, ASCII, Morse, AMTOR, TDM and Signal Analysis mode.

(cont'd on page 32)

MFJ Multi-mode



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You *can't* get all 9 modes in any other multi-mode at *any* price. Nobody gives you modes the MFJ-1278 doesn't have.

New Easy Mail™ Personal Mailbox

You get MFJ's new **Easy Mail™** Mailbox with soft-partitioned memory so you and your buddies can leave messages for each other 24 hours a day.

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MFJ's unequaled tuning indicator makes it easy to work HF packet stations.

You use it the same way for *all* modes -- not different for each mode.

Multi-Gray Level FAX/SSTV Modem

You'll enjoy natural looking pictures that multiple gray levels can give you.

New Anti-collision technology

MFJ's new *Anti-collision* technology gets packets through faster, more reliably.

How? Automatic random transmit delays prevent packet collisions.

Plus more . . .

Plus you get . . . 32K RAM, free AC power supply, KISS, *true* DCD, free eprom upgrade, random code generator, independent printer port, lithium battery backup, RS-232 *and* TTL serial ports, *standard* 850 Hz RTTY shift, socketed ICs, tune command, automatic serial numbering, programmable message memories, dual radio ports and more -- all in a sleek 9½ x 9½ x 1½ inch cabinet.

MFJ Packet Radio

MFJ-1274
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MFJ-1270B
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MFJ-1270B super clone of TAPR's TNC-2 give you more features than *any* other packet controller -- for $139.95.

You can operate both VHF *and* HF packet because you get **high performance** switchable VHF/HF modems.

You get **Easy Mail™** Personal Mailbox, FAX reception, KISS, Net Rom compatibility, 32K RAM, AC power supply, one year *unconditional* guarantee and more.

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Digital Digest

-DATACOM

by **Norman Sternberg, W2JUP**
279 Adirondack Drive • Farmingville, NY 11738

BBSs & Censorship

Looks like we're once again plagued with that tired old tempest in the PBBS teapot because someone has raised the old specter of "censorship". So once again I'll add my own two yen worth here.

Having operated a landline BBS for some years and later a packet BBS, and more recently a six-port packet message switch and HF/VHF/UHF mail gateway, I think I understand both sides of this coin reasonably well. So, I'll say it up front, nice and loud, in plain English:

YES - I DO CENSOR TRAFFIC PASSING THROUGH MY PBBS.

I've "censored" perhaps only 20 or 30 of the more-than 150,000 traffic messages that have passed through my PBBS since I put it up in 1984.

A few of these messages and bulletins were frankly and plainly commercial. Several pieces of message traffic were obviously business-related messages addressed to W1AW (which W1AW SysOps have specifically asked that we NOT forward). Two messages were frankly obscene. The remainder of the messages and bulletins were traffic that definitely involved illegal third-party traffic from countries with which we don't have a Third-Party Traffic Agreement.

Note that I DO handle "For Sale" messages that conform to the acceptability guidelines released by the ARRL and the FCC.

Here is my justification for "censoring" traffic through my own PBBS:

1. My PBBS is NOT a Public Common Carrier.

I am NOT a Bell Operating Company or MCI or SPRINT or Western Union.

My PBBS/Message Switch is a voluntary service that I provide at no charge. I provide this message and mail switching facility to the amateur radio community entirely at my discretion and entirely at my cost. There is no contract between me as the Provider and anyone else as the User of the services I provide.

I am NOT obligated by contract, implied or explicit, to provide any specific Grade of Service or in fact, to handle any specific traffic unless I care to do so, AND unless the traffic meets criteria for acceptability that I alone decide based on my 40+ years as a licensed radio amateur operator.

2. It's MY callsign and MY license at stake on my PBBS.

As long as MY message switching system carries MY callsign, I alone am legally responsible and accountable to the competent authorities as to the nature of my PBBS's operations.

This implies precisely the same type of responsibilities and liabilities as in the case of the licensee or trustee of a classical amateur radio FM voice repeater.

3. I screen every message that passes through my PBBS.

As the sole party responsible for my system, it's incumbent upon me and no one else to determine the suitability of any and all traffic arriving at my system for subsequent transfer to other systems.

It is my sole responsibility to determine that my system passes no traffic of any nature that violates any of the provisions of the FCC's Part 97.

4. Every message is kept on file for future reference and legal record.

I have an archival copy of every single message that has passed in or out of my PBBS since I brought up WA7MBL's original alpha-test PBBS. That's more than 150,000 messages on file on disk to date.

5. My PBBS operates in experimental conditions on HF.

As one of the HF/VHF Gateways operating under the FCC's STA (Special Temporary Authority) #7230-J for Unattended HF Operation, this question of legal responsibility bears exceptionally heavy weight.

It is my sole responsibility to ensure that my system does NOT pass on any traffic that in any way:

a) violates the FCC's Third-Party Traffic rules;

b) contains information of a commercial nature;

c) contains material that could be deemed indecent, profane or obscene;

d) contains copyrighted or legally protected material for which there is no authorization from the copyright holder or author;

e) contains material of a libelous or slanderous nature against any third party;

f) contains nothing that could be interpreted as encryption with intent to obscure the meaning of the information.

6. Message screening is necessary to ensure compliance with the law.

The only means by which I can safeguard my license and my ability to provide continuing service to my fraternity is to observe (read) the the transit traffic passing through my system.

It would be nice to be able to examine and verify all transit traffic BEFORE it's actually handled by my system. In many cases (especially flood bulletins) I exercise such control and this does occur.

To this end, and to ensure some minimal means of control, I use WA7MBL's "SWAP" routines to block the automatic transfer of ALL "flood" bulletins. The system "holds" them and does NOT release them until I've done my daily morning housekeeping, deemed them suitable, and released them to the networks.

But in ALL cases, the archival copies of all the messages give me a good measure of traceability. I can attempt to determine what was sent, who sent it, where it originated and, as soon as possible, take steps to see that events or messages that I deem to be unacceptable are NOT repeated.

7. Bulletin and broadcast message screening reduces wasted bandwidth.

My system DOES NOT mindlessly forward all messages and bulletins from one state to another, from one area of the country to all other areas of the country.

I DO examine the contents of ALL "flood bulletins" to determine if the information is relevant or pertinent to our area and more important, whether it is WANTED or NEEDED or REQUESTED by the SysOps of the systems in the eight states to which my packet message switch forwards message traffic and bulletins.

What's the point of automatically and blindly saturating the other regional BBSs with information that relates to meetings, hamfests, conventions and other strictly regional affairs that may be fifteen states away, or of interest only to folks in those immediate areas? What's the point of filling other systems with information that's three weeks old and already obsolete by time it arrives here?

By examining this type of transit traffic and ensuring that it's really timely, valid and meaningful for our area, and wanted by my neighboring SysOps and their users, I cut out the useless, unrelated or obsolete and out-of-date stuff. I achieve a substantial reduction of clutter on the backbones and minimize the waste of that most precious resource called "bandwidth".

8. Anyone can put up a PBBS or message switch.

Anyone who has an appropriate computer and packet controller can do exactly what I'm doing.

Anyone who puts up one of these systems assumes the same set of liabilities and responsibilities as I do.

Anyone who puts up one of these systems can run it any way he or she wishes, consistent with the Commission's Rules.

9. No one is obligated to use my PBBS or message switch.

However, anyone who does use my system does so at my pleasure and in accordance with the way I want my system operated. Whoever doesn't like the idea that may I screen all the traffic can use other systems to pass their traffic.

Anyone who disapproves of the fact that in some rare instances I actually DO delete messages that I deem inappropriate or not in accordance with my established procedures, is welcome to use some other switch, or to make me an offer to buy my system.

The system, including the computer as configured with hard disk drive, six serial ports, an Uninterruptable Power System, six TNCs, six HF/VHF/UHF radios, a tower and beam, five other antennas, and all the required power supplies, comes to about $12,000 in round numbers. That's my ongoing investment.

Above and beyond all questions of rules and regulations, ethics and morality, justice and injustice, I'll quote my own variant on Dr. Tom Clark's (W3IWI) well-known variant on The Golden Rule:

"He who spent the gold makes the rules".

That's my point of view on censorship by a PBBS System Operator. To each his own.

73, Norm Sternberg, W2JUP,
SysOp @ W2JUP-4 □

The DXer's Directory...

1990-1991 edition compiled by Fred Osterman, is off the press. A must for the serious SWL DXer or casual listener, the DXer's Directory contains complete listings of North American listener clubs, non-North American clubs, listeners by geographic area and photos of listeners and their stations. The book is literally a "who's who" of shortwave listeners and SWL DXers with over 1800 listen- ers in 75 countries included. The directory, which runs 88 pages and is priced at only $4.95 plus $1 shipping, is an excellen@ publication from Universal Radio Research 1280 Aida Drive, Reynoldsburg, OH 43068

Source: Westlink Report: 9/14/90

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CD-ROM IN THE HAM SHACK

I'm still reeling from my trip to the Dayton Hamvention. No, I didn't win the grand prize, or any small ones for that matter. It's because I had an impulse to buy a CD-ROM (compact disk - read only memory) player to hook on my "writing" computer.

I have three active computers in my shack, plus the AT clone (VGA) that I use for writing, desktop publishing and AMSAT's super "Instant Track" program for satellite tracking. I also have two working 1976 model SOL computers with North Star disks and software in my antique collection.

I've wanted a CD-ROM reader for some time, so when the urge came over me while standing at the Buckmaster booth in Dayton, it was hard to resist. They were offering a player, plus the disk containing a list of all the Amateurs in the United States for an attractive price, so, without thinking too long, I popped.

The machine arrived a couple weeks after the hamfest. I pulled the lid off the AT clone and stuffed the controller card into a slot. Then the fun began.

I had to unravel three instruction books and sheets trying to figure out the sequence of installation moves. I will say Buck didn't really simplify the procedure with his sheet of instructions. He gave you an idea of what to do, but nothing specific. Anyway, I puzzled it all out and it finally worked.

The CD-ROM with the Amateur calls on it contains about a half million US call signs and addresses that are reachable with the search program included. There is also a huge pile - maybe a couple thousand or better, I didn't try to count them of shareware programs for the Amateur. I found the same software that I am running for my W0RLI BBS, along with the WA7MBL stuff for the same purpose, in the program files. I've been too busy to dig deeper into the program stack, but believe me, there is a heap of stuff along with the call sign file.

The call sign file contains all the call signs from the FCC files, end when 1 say "all" I mean ALL. If someone has died in the last few years, their call is in there, go I guess that if a call sign has expired, it's in there also. I went to the funeral of WOMZE five years ago, his license expired two years ago, but Mart is still in the list.

Now that we have licenses with 10 years life, I wonder how many Amateurs have given up the hobby, moved to a new address and are still on the role. Maybe there is something good about having to renew a license in just a few years after all.

Buckmaster has rigged the software so you can only take 50 calls at a time from the master file. They're in the mailing list business, so they can sell you passwords that will allow you to take either 500 or an unlimited number of addresses off the CD-ROM. I fooled around exporting some of the calls to a word processing list, but in my first attempt I discovered that I will have to work at it to make a decent mailing list, should I try.

The CD ROM works great for finding anyone by call sign, address or zip code. The list also includes birth year and expiration of license date, so you can shuffle them that way too.

I really like the idea of having the Call Book on computer. I wish the publishers of the Amateur Radio Call Books I have been buying for years would release their books on a CD-ROM. The type in the printed books is getting so small I've been known to take a Call Book to my workbench, where I have a magnifying lens, in order to decipher a DX address. I'd pay the same as for the books, if I could get them on CD-ROM now that I have broken the ice and installed the player.

One of my biggest reasons to get the CD-ROM unit was so I could get Microsoft's program "Bookshelf." As an erstwhile writer and desktop publisher, I have been intrigued by the idea of having a dictionary, Thesaurus, Bartlett's Quotations, The World Almanac and a zip code directory, plus a bunch of other stuff, right in my computer when I am writing my columns, etc. I've had the Thesaurus and spelling checker for years, but the addition of the dictionary and the quotation file is what I really wanted. Now I have it. Well, almost.

When I purchased the Bookshelf program from my usual supplier of software and plugged it in, I was taken by the date on the software: 1987. I called Microsoft and asked if there was a later version. The answer, after I went through two people who admitted they didn't know much about the Bookshelf program, was "NO." So the World Almanac, which is published every year, is about three years old. I'm not given too often to looking up obscure statistics like the current population of Zambia or who had the best batting average last year, but I would like to know I have the latest edition when I do.

I also discovered that Microsoft does not support my favorite word processing software, although Bookshelf works fairly well with it. They do support some of the more popular programs, but they have only issued updates for two of them in recent times. I gathered from talking to the nice lady (#3) at Microsoft that "Bookshelf" is a down-the-list product in their multi-million dollar software business.

As a result of the call, I received the update fix program. Now I'll have to buy another word processing system to get the full benefit of the update. In the meantime I've learned to get along with the less than 100 percent operation of the CD-ROM, and I think it's a great addition to my computer.

I find I spend a lot of time exploring the cracks and crannies in the megabytes of information at my fingertips. There certainly is a pile of stuff on those two little' CD disks - it's amazing.

Here in Fargo we have a local phone line bulletin board that has a CD-ROM hooked into it. The system operator tells me there are 8,000 shareware and public domain programs on it and that I can buy the CD disk for $149. The system is growing so fast that the next edition will have an estimated 12,000 programs. Wow!

by Bill Snyder, W0LHS from his column The Digital Bus in World Radio Magazine

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If you have news or information of interest to the digital amateur radio community, please let us know!

Monitoring the Middle East

Here is a selection of English language broadcast from easily heard stations in the Middle East.
Exact broadcast times and frequencies may vary.

COUNTRY	STATION	BEGIN	END	TARGET	FREQUENCIES (kHz)
Egypt	Radio Cairo	2:00	3:30	NAm	9475 9675 (Nx: 02:15)
		12:15	13:30	SEAs	17595
		16:30	18:30	CAf/SAf	15255
		20:30	22:00	WAf	15375
		21:15	22:45	Eu	9900
Iran	Radio Tehran	11:30	12:25	As	9575 9705 11715 11790 11825
		19:30	20:30	Eu/NAm	6035 9022
Iraq	Radio Baghdad	20:00	22:00	Eu	13660
		1:30	3:30	NAm/SAm	11830
				In/Pak	11810
Israel	Kol Israel	0:00	0:30	Eu/ME/NAm	9435 11605 15640
		1:00	1:30	Eu/ME/NAm	9435 11605 15640
		4:00	4:15	Eu/ME/SEAs/Pac	9435 11605 11655 12077 15640 17575
		17:00	17:15	Eu/NAm 11585	11655
		19:00	19:30	Eu/ME/NAm/Af	11605 12077 15485 15640 17590
		21:30	22:00	Eu/ME/NAm/SAm	11605 12077 15640 17575 17590 17630
		23:00	23:30	Eu/ME/NAm	9435 11605 15640
Jordan	Radio Jordan	11:00	13:15	WEu/NAm	13655 (Nx: 11:00, 13:00)
		13:20	16:30	WEu/NAm	9560 (Nx: 13:20, 16:00)
Kuwait	Radio Kuwait	5:00	8:00		15345
		18:00	21:00		13610
	(Haven't heard R. Kuwait since the day of the invasion.)				
Saudi Arabia	BSKSA	18:30	19:00	EEu	9720
				WEu	9705
Syria	SARBS	20:05	21:05	Eu/NAm	12085 15095
		21:05	22:05	Aus/NAm	12085 15095
Turkey	Voice of Turkey	3:00	4:00	NAm/Pac	9445 17880
		12:30	13:00	As	17785
		20:00	21:00	Eu	9795
		22:00	23:00	Eu	9685
				ME	9665
				NAm	9445
				As	17785 17880
UAE	UAE Radio Abu Dhabi	22:00	24:00		9600 11985 13605 (Nx:23:00)
	(Since the invasion, Arabic seems to have replaced English in this time slot.)				
	UAE Radio Dubai	3:30	4:00	NAm	11945 13675 15435 15400 (Nx: 3:30)
		5:30	6:00	FE/Aus	15435 17830 21700 (Nx: 5:30)
		10:30	11:10	Eu/NAf	15320 15435 17865 21605 (Nx: 10:30)
		13:30	14:00	Eu/NAf	15320 17775 21605 (Nx: 13:30)
		16:00	16:40	Eu	15320 15435 17865 21605 (Nx: 16:30)

Information supplied by:
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/ Downloaded from CompuServe's HamNet

Digital Digest

BITS & BYTES

by **Lacy McCall, AC4X**
3001 Zelda Drive • Montgomery, AL 36106

Some Year

Looking at history, some years seem rather uneventful for both individuals and nations. Others are packed with change and happenings of note. The year 1990, seemed back in January, to have the potential to be even, quiet and perhaps one of those times that pass without bringing much change; at least not much unset- tling change.

As we face enter the twilight of the year, it turns out that we have had a real hummer. From the great strides toward freedom and democracy seen in Europe, now we face an almost certain war in the middle east. This has brought back inflation and the beginnings of an oil crisis, which we thought only a bad memory.

At the same time, the economic reality of our becoming a debtor nation, coupled with high taxes and spending, is giving the U. S. lots of trouble. Where we have been the leaders of the economic world, Japan and Europe are leaping ahead, competing with us head to head, in areas where we have managed to remain dominant in recent years.

In short, what we are seeing is a year that is producing more change than most find comfortable. Technology has forged ahead as usual with it's logarithmic advances; yet new products are find- ing a shrinking market.

Previously, this column has touched on the changes in Amateur radio. We have an aging group which is shrinking, and the spec- trum we use for our hobby is so valuable, we find it hard to maintain our foothold. Economic pressures on individuals who either are Amateurs or might like to become part of the fraterni- ty, are making it even more difficult.

Without expendable income, people cannot buy the new equipment we see on the market. Without the sales, the companies working hard to leap forward, cannot provide the development capital necessary to continue.

This is a trend we have seen in the last decade and not new, but 1990 as it is wrapping up, may well be the year that we bury the small technical company entirely and only find products of the large world wide conglomerates. As the tools of Amateur radio have become more sophisticated and considerably more expensive, a few small firms have managed to maintain their niche in the market; but likely that is passing as well.

No one can predict what a war in the middle east will do to the world economy; particularly since would oil supplies could be drastically affected. It also appears, no one can predict and even our leaders cannot agree on action to try to keep the econo- my on any reliable course.

What you and I can predict however, is that we as individuals are directly affected by it all. Before the end of the year our composite emotions will have been battered by all the events in 1990; and along with the emotional upheaval, our lives and bank balances have changed. Unlike the song, I don't think we will necessarily call it "a very good year."

LOOKING BACK ...

In one of the earlier columns, I introduced the fiction piece called "Lonely Road." It was futuristic, and looked a world that was controlled and changed. If you keep old copies of Digital Digest, it might be worth taking a few minutes to dig it out and read it again. At the time it was written, it appeared that the changes presented might be evolutionary and gradual. Now I'm not so sure they might not be thrust on us by the changing and vola- tile world.

ONE MORE TIME ...

Just received from the ARRL, is a flyer telling of the 1992 World Administrative Radio Conference (WARC-92) of the International Telecommunication Union (ITU); where representatives of each country meet to decide matters affecting the radio spectrum.

The ARRL was very informative in the newsletter, pointing out their past successes in behalf of the Amateur community, and asking for bucks to do it again. Whether or not you contribute, is a matter for you to decide, but please do take time to read the information provided and understand what is happening. You will be affected by WARC-92 whether you like it or not, and the ARRL is the only representative that stands a chance of offering any assistance to us a group.

Pressure by commercial interests, in seeking the use of the frequencies we enjoy, will not abate and most likely will contin- ue to increase. The asset we have been able to maintain will surely erode some, but just maybe we can slow the process.

CONSOLIDATION IS A BIG WORD ...

One of the real joys of Amateur radio has always been the diverse nature of both the people and hobby. A steel worker in Pittsburgh could contact and chat with a Senator from Arizona, or a King in Jordan. That's pretty diverse.

Just such a contact could be made using morse code or phone using a variety of techniques and now can even be via satellite using digital transmission. That's pretty diverse.

As times change, and our world shrinks, what I predict is that we will soon see a consolidation of both facets of the hobby.

Not too far off, the hobby will be too expensive for many to afford. To continually upgrade to the latest equipment, will require too much of an outlay for many. The hobby will pass completely from the "tinkerer," who could make his own equip- ment, to the equipment operator with the money necessary to afford the hobby. Technology along with frequency changes and mode advances, will make the older equipment so outdated, it can no longer be used; removing the last source of inexpensive equip- ment. Maybe it won't become a rich man's hobby, but it is fast becoming an affluent man's hobby.

Likewise, we have no way as a group, even with the ARRL doing it's best, of saving our current frequency allocation. Forces too powerful and wealthy, are on our case and want what we now have. In a world where "might (often) makes right", it is naive to think that we stand much of a chance in the war. We may win a battle or two and we may delay the inevitable, but it's coming.

At present, my opinion is that we do not make very good use of the frequencies we have. Part of the reason is that for us to communicate, we all need to be in the same place. The result is that some frequencies are very crowded while others are dead silent. There is no way we can support the continued use, particularly exclusive use, of unused spectrum.

What I would propose, is that we take the "bull" and "grab the horns"; avoiding the tail which will otherwise be ours. We have changed, so let's face that first. Let's look at what we really need for the "NEW AMATEUR RADIO."

The first requirement, are bands for normal operation, which must be varied enough to offer the propagation necessary during varying sun spot cycles and times of day. This may well be limit- ed to 80, 40, 20 and 10 meters. With these bands, we have access to world wide communication using various HF modes. As far as VHF is concerned, probably two bands would give us ample operating room.

All that is just for normal operating, and what we would need to seek is ample space on each band to use now and provide for expansion. Then there is the experimentation space we seek. Although I am not well versed in this area, there surely must be a set of frequencies that are important and many that we now use sparingly. I do believe we don't need lots of band space for experimentation, just a variety.

If you have been paying attention, you have noted that I ignored some bands like 160 meters. I am aware that there are those who covet this band and don't operate anywhere else, but we must face the fact that we can't remain the same and except for the DX challenge of 160, the use 80 meters will provide about the same propagation and opportunities for contact. The same, can be said for those "in between" bands not included in my HF list.

Personally, I have never made a contact on 220 or 440 so it's all right with me if the taxi's have those frequencies; but other's disagree and we should look at what is needed and what we truly use. Not only will that give a much more defensible position in the frequency battle, it will make the equipment less expensive. A manufacturer can provide the same number of units in fewer models, which is the trend every where in the world except Ama- teur radio.

While, I am proposing such a radical departure from past posi- tions, let's look a one more aspect of the hobby that would be affected by this change. Development of new products and modes, and perfection of the old. If we could limit the modes of all but experimental transmission, to those we really use, we can concen- trate our efforts. Everything I have seen that is anywhere near the frontier of progress has to do with computer processing.

Where we require a variety of computer processing techniques for a variety of different processors, I propose some general agreement of a standard. Within the packet systems, this has occurred by evolution with BBS systems like MBL, which use the PC. I do not propose limiting anything as far as experimentation is con- cerned, but we should seek more uniformity in application first. If a better mousetrap comes along, you can bet the standard will change. Without pioneers, we will stand still; however, what we don't need, and cannot afford are multiple, duplicating systems that only add to the confusion for us all and dilute our talents.

Any effort in this regard must come from groups like TAPR which have let the way toward uniformity. Personally, I would like to see their focus broaden to include more areas of digital communi- cation and let a consensus develop among the experts, as it will. If such were to happen, the danger is the alienation of some groups that think their corners of the world are sacred; which they are not.

I guess what I am saying and trying to be polite about, that we should dump those systems that cannot gain wide acceptance. Maybe they are good, and just not widely used. Dump them just the same and take their really good features and incorporate them into the better systems.

If we have 1000 bright minds, working on 1000 different projects, we are wasting our resources. Let's focus on what our goals should be. Let's consolidate our talents, so that those 1000 brains can make greater strides with just 10 projects. There will always be others that will experiment and bring new ideas.

KEEP IT SIMPLE ...

Most of us are overwhelmed by what has happened to us all in recent years. The world has become a very complicated place. Our hobby is threatened, and itself has become very complicated. More and more expertise is required to repair our equipment, not to mention use it.

If we as a group can manage to simplify our objectives and needs, we stand a much better chance of survival and success in a more complex world. Phil Kam said it first, or perhaps coined some- thing he had heard: "keep it simple, stupid!" Let's not be stu- pid, but let's try to simplify things a bit.

TEASER OF THE MONTH ...

Recently, I was monitoring the local 2 meter repeater, used by the gang to pass time to and from work. One of the regulars was relaying a tale about another "good old boy" who was a ham and drove a pick-up truck.

This guy had been to the beach for the weekend, and encountered a blond beauty, sunning without her bikini top. Being very patient, he had waited in the shade of a cabana, sipping a few cold ones, waiting for the girl to turn over, face up.

As the tale was told, the old boy just about got crocked waiting. He had his handi-talki by his side and had kept all the coastal locals informed on his vigil. During his wait, he had described for the microphone, the beautiful lower curves, the dark brown tan line along the edge of the bikini bottom, and the tiny gold ear ring peeking from beneath the long blond hair.

He had been tantalized and tortured more than he could stand, and you can be sure that those on the other end of the repeater link were just as lusty. Finally at the urging of his radio buddies, he could stand it no longer. He approached the beauty, and the only thing the could think of, was to ask the time.

Our hero was promptly advised by the beauty, who rolled over to respond, that he had no watch. What the beauty did have was a five o'clock shadow and flat chest.

As the tale concluded, this astute story teller reminded those listening, that "everything you see is not always exactly what you think, so don't get so fired up over the wrong thing!" ☐

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by **Mike Bryce, WB8VGE**

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Battery Charge Controllers

The techniques by which batteries are charged via photovoltaics have been, and still are, varied. Do you really need a charge controller? Perhaps not. As each system is different, so are the choices. Why do we need a charge controller? Well, in the most simple terms, a charge controller will prevent the batteries from becoming overcharged.

Overcharging leads to a variety of battery ailments, not the least of which is shorten life. Herein lies the problem. How do you charge the batteries to their fullest, without excess gassing? There are several means by which we can accomplish this task. Some involve rather complex electronics. Therefore, two basic methods are used. Of course, there are other methods, as we'll see later on. But for now, the two most common are; shunt and series controllers.

Let's look a bit deeper into the shunt method of battery charge controllers. The purpose of any battery controller is to control the flow of current from the array to the batteries. Ordinarily, most batteries will be far better off when they are not charged at full current right up to the maximum level. The controller will then reduce the flow of current and maintain a float charge on the battery bank.

In the shunt controller, as the name implies, we "shunt" the excess energy away from the batteries as they become fully charged. Lets run through the workings of a shunt controller. We'll start off with a 80% charged battery and a bright clear sky. In the morning, as the sun rises, the photovoltaic array starts to produce voltage. Not current. Remember, the photovoltaic cell is a constant voltage source. As the sun continues to rise, the voltage slowly becomes higher than that of the battery's voltage. Current now begins to flow into the battery. The battery slowly begins to charge. The controller will allow the full array current to flow into the battery bank.

Whatever the array can produce in current, the battery bank can have. As the battery becomes more charged, the terminal voltage will increase. By using this terminal voltage, the controller can decide when to start reducing the current. Now, before we get much deeper, the terminal voltage needs a closer look. In just about every charge controller made, the battery terminal voltage determines the outcome. If everything was right with the world, battery terminal voltage would reflect 100% the conditions of state of charge. In real life, sometimes the terminal voltage can be tricky to read, accurately.

Controllers that "make decisions" about battery charging based on battery terminal voltage are very sensitive to errors caused by a battery charge rate that is too high. Very high charge rates will produce a battery terminal voltage which does not accurately reflect the actual battery state of charge. Some people bypass this problem by increasing the state of charge voltage to a higher set point. The result is exactly what the controller is suppose to overcome. We end up over charging the battery!

On the other hand, suppose we have a small amount of charge current, and a large battery bank. The controller will then be confused into never shutting down the charge current. This is because the terminal voltage will never reach the state of charge set point. The end result? Overcharged batteries. Proper array sizing and battery sizing are a must! This is exactly the process behind the so called "self regulating" panels. Lower voltage panel and a proper sized battery storage system In the shunt controllers, we can overcome some of these problems. As the battery becomes charged, the terminal voltage will rise. The electronics have been looking at terminal voltage and at the state of charge set point, the controller will start to "shunt away" the excess current.

In most shunt controllers, they shunt the array to ground via a resistor bank. The resistor bank becomes the energy dump. The resistor dissipates the array's energy in the form of heat. As the battery becomes fully charged, most of the array's power will be turned into heat in the shunt's load resistors. The battery bank will then be allowed to float at whatever current the batteries will take at the state of charge set point. Other methods of shunting the current away from the batteries can be used. Sometimes the array is shorted directly to ground though a transistor switch.

Now lets suppose we place a load on the battery bank. The load will reduce the terminal voltage of the battery bank. This will be noticed by the controller. The controller will now allow more array current to flow back into the battery bank and help run the load. If we increase the load further, the controller will send all the array current to the battery bank and the load. Because of the smooth feedback from the battery to the array, the shunt controller provides excellent battery control.

Aside from excellent control, the shunt controller is 100% solid state. There are no moving parts. The electronics can be sealed from the weather and critters. Sounds very good does it not? Well, there are several major problems with the shunt controller.

First, they generate a huge amount of heat in their operation. Heat as we all know is the number one enemy of electronics. In large arrays, we might have to get rid of several hundred watts of power. That much power makes for some very hot resistors. When the shunt controller is working, it must separate the array from the battery bank. Therefore a blocking diode is a must. It also becomes a source of heat too as well as increase the parasitic losses within the system. Because of the amount of heat produced, most shunt controllers have an upper limit of about 20 amps of array current.

To increase the amount of current that you can control, we can add more shunt controllers to divide the array current into small hunks. In a way, it's not a bad idea. If one controller fails, the others will still provide some array current to the battery bank. Most shunt controllers cannot stand to have the array connected without the battery. Up in smoke they'll go. Accidental reversal of battery polarity during installation will mean a certain death to the shunt controller. Of course, not all models have these problems. Must can and have been engineered out by the manufacturer.

Is a shunt controller for you? Perhaps. If you have several panels in your array. Like the idea of quite operation. No relays to go bad or stick. Smooth operation. And don't mind the heat produced, then by all means look into the shunt controller. If you're producing large amounts of array current, don't want to mess with the heat being generated, then look into the second type of charge controller, the series method.

As the name implies, the series method incorporates a switch in "series" between the array and the battery. The switch can be either an electromechanical relay or a transistor. In recent months a rather new device has been seen. The VMOS FET transistor. Using almost no drive current and very low turn on resistance, it has been coined as the perfect transistor. The workings of the series controller is as follows: Assume 80% charged battery and again our bright clear day. As the sun rises, again the array starts to produce voltage. This voltage wakes up the controller.

The series control element, in this case a relay, will close. As the sun rises higher the array will start to generate higher voltage. The voltage will become higher than that of the battery bank and current will begin to flow into the battery. Using the battery's terminal voltage, just as the shunt controller did, the control logic will sense the battery becoming full. When the terminal voltage reaches the state of charge set point, the controller will turn off the relay and all current will stop. Well there are several things wrong with this. This is called a single stage series controller. The controller will turn the current on or off, with nothing in between.

Lets look at it from a different point of view. Suppose we replace the battery with a one gallon jug. You know the kind, like cider comes in. Replace the array with a 50 gallon barrel of water. Now try and pour the water from the barrel into the gallon jug, as fast as you can. Notice what happens, water all over the place and very little in the jug. We see all the water going all over the floor and we stop pouring. The end results? Only a very small amount of water goes into the jug. So goes it with the single stage series controller. The array will cause the terminal voltage to rise rapidly. The controller will sense this and turn off the current. The battery is not fully charged. This can happen very easily near the last part of the charge cycle, when the terminal voltage is very close to the state of charge set point.

Ok, then how does one get around this problem? We can use a second stage of current flow. Lets look again as we charge the battery. As the state of charge set point is reached, full array current is flowing into the battery. When the set point is reached, the relay will open, stopping array current as before. Now with a second stage series controller, a small regulator will float the batteries at a set point just under the state of charge condition. This regulator will supply about one third the current to the batteries. This of course depends on the design of the unit. Since the float regulator is a constant voltage source, the batteries will float at the current they need. A float current of only several amps will top off the final 10 percent of the battery capacity.

As you can see, only the two stage series controller should be considered. Of course you don't get a free lunch with the series controller either. In the case of the series relay, you'll have one moving part--the relay. As the relay turns on and off, several times a day, this adds wear to the relay. Now just because a relay is warranted to work for lets say 50,000 operations, the relay will not just stop on the 50,001 cycle. Only the relay's contacts have depleted below the manufacture's specifications. A relay will also add to the current required to operate the controller. This "parasite current" should be taken into account when using a series controller with a small array and or battery system.

In most cases a blocking diode will also be needed to isolate the battery from the array. Some of the series controllers that I've designed have some extra circuits that allow the use of no blocking diode. If a relay is not used to control the flow of current, then some other means must be used. Transistor switches have been used, but the drop of .7 volts adds losses to the system. This drop also produces heat, which must be removed. Newer units use power VMOS FETs to turn off and on the array current to the batteries. FETs also produce heat due the the voltage drop across them, but far less than their transistor cousins. FET controllers can handle upwards of 150 AMPS (!) of current. Also, with power FETs, one can pulse them on and off, at a very high rate of speed, up to the RF frequencies if need be. This pulse width modulation eliminates the need of a second float stage.

In a FET controller, as the batteries become charged, the FETs are turn off more than they are on, this reduces the current to the batteries. When we place a load across the battery, the FETs are turn more on than off. This allow more current to flow to the batteries. Clearly, the FET series controller has a lot to offer.

Should you consider a series controller? Perhaps. I've been using one for quite a long time. I find most to work quite well. If you have a lot of array current, consider the series controller. Smaller arrays can of course use a series controller, just watch the stand-by current. You don't want to feed all your power to the controller.

There are many other methods used to control array current. For our needs, these two you'll see the most. There is no "right" controller for everyone. Select the controller for your system. Remember, as you add more panels, you can easily exceed the current rating of either controller. Plan ahead. Since electronics have a bad habit of changing all the time, some of the problems I've talked about have been fixed, some have not. Depending on who makes what controller. In either the shunt or the series controller, look for these features.

Field adjustable state of charge settings. Large connections for array and battery cables. Environmental considerations. Can it stand up in a un-heated barn? How about bug proof. Some bugs and other critters actually eat electronic components. Temperature extremes. Will the unit operate when the temperature hits 100 plus degrees in the barn?

Elmer proof. People can sometimes be worse than anything! Make sure the products come with good instructions. Clearly marked connections are a must. Battery temperature compensation. This is a nice to have item, if your batteries are outside and subject to swings in temperature. Best to measure the actual battery electrolyte temperature. However, the acid contents has a habit of eating up temperature sensors. Therefore the sensor must be affixed to the outside of the battery. You have to insulate the sensor from the ambient temperature. And two last items, warranty and price. As in all cases, you get what you pay for.

I've always been a electronic hacker and builder. I've built several charge controllers and have learned quite a lot. You also might want to give this route a try. In some up coming Home Power issues, I'll have some schematics for some simple charge controllers, both shunt and series types. Hopefully, you'll now have a better understanding on the how and what nots of charge controllers. Since the batteries are the heart of any solar electric system, choosing the charge controller that will protect them should be a bit less painless now. ☐

If you have news or information of interest to the digital amateur radio community, please let us know!

The AMIGA CORNER

by Ben Williams, AA7AS
RR 1, Box 4272 • Glasgow, MT 59230

Visit To Commodore

Last month I had an opportunity to visit Commodore at West Chester. We had been invited as a result of our work on our new graphics system for the Amiga, and as a result were given what I'd have no qualms about calling "The Grand Tour".

Before I tell you what I thought when the time came to leave, you should know that I have not been a fan of the company in times past, for what I still consider very good reasons. I've been known to write things like "The worst thing that ever happened to the Amiga was Commodore...". Without getting longwinded, the basis for that opinion was (mostly) the complete lack of marketing of the current model machines combined with the fact that CBM had released no new Amiga models in years.

The Amiga a3000 and the CDTV units are both new models, and one of them is even shipping so some of my concerns have been vanquished by events. Other items appear to be on the verge of hitting the market as well, so on this point things look a lot better lately.

As to the marketing, I still can't really jump up and down - but there is a great deal of progress in areas that CBM had either been ignoring or approaching in a non-effective manner. For instance, the government and educational institutions are now being approached as markets, both of which are (in my opinion) as important in their own way for the acceptance of a hardware platform such as the Amiga. They still have yet to produce an effective ad campaign, either in print or for television. Every time I see an Apple commercial, I cringe. Commodore could wipe them off the face of the earth with features and performance if they'd only wake up and smell the roses.

I can't be specific about what I saw in the realm of new hardware or software at CBM during this visit, but I can say that I came away feeling like they really are trying in these departments. Quite aside from the v2.0 release of WorkBench (which is wonderful, by the way) there are things "cooking" in there that should make all Amiga owners just this side of too happy if and when they are placed on the market.

Some scattered impressions that stayed with me were that the West Chester operation is big - I mean, really big. It takes up a large portion of an industrial park all by itself. The buildings are big, bustling and packed with energetic people doing... uh, things I can't tell you. There is a (new, in my opinion) great deal of concern for documentation - I saw a lot of activity related to manuals for a number of current products, as well as... other stuff.

Overall, I feel as if there really is a new Commodore out there, and we can count on the people there for some honest pushing of the Amiga towards a marketplace that is still, in large part, unaware of how much better it is than the Macs, PCs, STs, and even the ill-fated NeXT machines.

New Color Hardware:

This is a great time for the Amiga in terms of the display output you can create with your machine.

For 2000 series frame owners, Impulse has completed their FireCracker 24 board, and will have them available to ship in October, according to the company. They indicate it has passed the FCC tests, and so are rolling with production. The FireCracker 24 comes standard with one megabyte of memory, providing a spacial resolution of 512 horizontally by 482 vertically, and boasts 24 bits of color resolution per pixel. Retail price is to be $1200.00 for this version of the FireCracker, and approximately $1600.00 for one with 2 megabytes of memory (which gives you more spacial resolution). These prices are reasonably comparable to 24 bit systems for the Macintosh and the PC, and bring the Amiga machines solidly into the 24 bit realm for the first time. The FireCracker provides RGB output.

Digital Creations hopes to have their "DCTV" composite output system somewhere around November. This is a device that provides NTSC style video directly; RGB and Genlock capabilities are available via an extra cost adaptor. DCTV will come with a special paint program at no extra charge.

Black Belt Systems is currently shipping our HAM-E graphics system. This provides up to 384x480 or 384x512 (in a PAL system) of 18 bit color resolution, and retails for $299.95 directly from us. Notable features include the ability to work with any model Amiga, 500, 1000, 2000, 2500 or a3000, both NTSC and PAL machines. Free paint and rendering software some with the units - complete 'c' language source code for both pieces of software is available on our open BBS system at (406) 367-ABBS. The HAM-E provides fully genlockable RGB output.

When CBM releases version 2.0 of the AmigaDOS operating system (which should be this month) for all machines, you'll be able to purchase a new "Denise" chip for your machine which will let you display some higher resolution modes - you probably know all about them from articles in Amiga World and other mainstream Amiga magazines, so I won't go into them in detail here. Suffice it to say that these are definitely worth having!

CDTV ---- This little jewel should be out this fall in time for the Christmas season. If CBM manages to make that happen, they may have a real winner on their hands - I had the opportunity to see a unit operating, and was extremely impressed with the implementation of the software interface to the user, and the sheer attractiveness of the unit. At the price (under $1000.00), it offers capabilities the average TV couch tuber has never had before, and is glitzy to boot. Let us hope that CBM pulls this particular rabbit out of the hat.

LOGic Personal Database Systems 2634 Meadow Bend Court, Duluth GA 30136-6037 (404) 242-0887 ---- I recieved a program from Personal DataBase Applications called "LOGic". This is a "port" of a program written in a database language using the Amiga product "DBMan". It is intended to help you log your contacts. I have not yet gotten it running completely on my system, so I'll just touch on it here. I'll do an in-depth review shortly.

On the positive side, offers a wealth of features and seems to be extremely comprehensive, even offering some remote control operations on radios that are equipped for this. Dennis Hevener, WN4AZY, seems to be quite enamored of the Amiga and indicates that the company intends to do it's future development on the machine. The manual is very large, and covers logging, finding log entries, report generation, Awards progress tracking, contesting (yech!) gray line propogation, and data import/export capabilities from various spreadsheets and word processors.

On the negative side, it's really a very large program, and can be installed only on hard drives. It is also obviously not an "Amiga" program; the user interface, while easy to operate, is very poorly designed - just menus with numbers you type in. It also has some holes in it's error handling; during installation it couldn't do something (I don't know what) and quit back to the system... there was an error message but it was in a window that the program closed, so I didn't get to see it long enough to register what the problem was. I'm sure this was my error, but I have not been in contact with PDS to have them help me out with this.

More on LOGic next time, after I've gotten it working 100%.

CompuServes Amiga Forums:

CompuServe has expanded from three Amiga forums to four. The old forums were called Amiga Vendor, Amiga Arts, and Amiga Tech. The new forums are Amiga User, Amiga Vendor, Amiga Tech, and Amiga Arts. There is now more library space, and more subject area which should benefit all users of CIS.

Till next time...

That's all I have for this issue. Next time, with any luck, we'll be able to tell that Impulse is shipping FireCracker units, CBM is shipping 2.0 to a2000 and a500 owners, and perhaps even that CDTV is shipping. ☐

YAESU U.S.A. Announces One Year Parts & Labor Warranty...

effective with purchases made July 1, 1990 and after. A company spokesperson stated "All Amateur radios and accessories will be warranted for one full year from date of purchase. A valid dated receipt will be required as proof of purchase and be included with any equipment returned to Yaesu for warranty purposes."

Yaesu will reserve the right to evaluate the returned equipment to determine abuse, unauthorized modifications or equipment failure other than normal circumstances.

The one year warranty will be valid for the original equipment purchaser only and available for products sold by YAESU U.S.A. in the United States and its possessions, as well as in Canada. ☐

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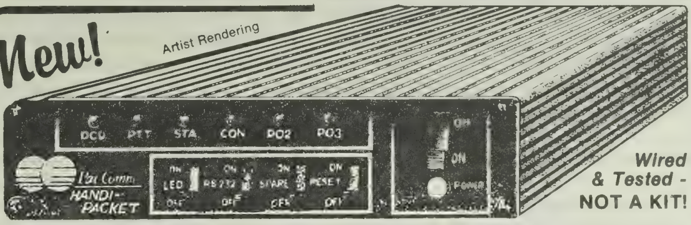

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COMPUTERS

by Johnathan L. Mayo, KR3T
3908 Short Hill Drive • Allentown, PA 18104

Portable Packet

The previous Computers column wrapped up a three part series on landline telecommunications. I hope you found the series useful and informative. There is a great deal of amateur radio related material available by modem. The series covered the basics of landline telecommunications as well as some popular bulletin boards to dial. In future column installments, I'll introduce additional amateur radio related bulletin boards that you can dial into.

But, for now, let's leave the telephone lines far behind and shift topics. In this column, I'd like to discuss the intriguing topic of portable digital operation. Since most portable digital stations are equipped for packet only, I'll use packet as the primary example in this column.

In last issue's IBM Arena column, I covered laptop PCs and their applications as portable terminal emulators. If you read that column, you know that I have a new laptop computer that has replaced my venerable Radio Shack Model 100. The new PC is a Toshiba T-1000SE and it serves as an excellent terminal for my portable packet station.

In addition to replacing my Model 100, I've also retired my reliable PacComm TNC-200 (CMOS version) that I used in my portable station with the Model 100. Readers of my book, The Packet Radio Handbook, will probably recognize my old system, which is described in Chapter 5, and accompanied me on many a trip and vacation back in the earlier days of packet radio.

Today, I use a Heathkit Portable Packet TNC. This remarkable TNC measures scant inches in dimension and contains an internal, rechargeable battery. I carry the Pocket TNC as well as an Icom 02AT in my T-1000SE's carrying case. In fact, the Pocket TNC was selected for use in the upcoming SAREX shuttle mission.

The remainder of this column discusses portable packet operation in a general sense so that readers with a variety of experience, equipment, and objectives will (hopefully) find some information of use.

Portable Packet

Portable operation with packet radio is very useful. It is a lot of fun and can be used while on trips or vacations. Emergency communications is an area of amateur radio that benefits greatly from the application of packet radio in the field. It is possible to fit an entire packet stations with smart terminal, TNC, and radio in an attache case with room left over.

The basic requirements for a portable packet station are that it must be truly portable, consume as little power as possible, and possess full operating capabilities. A portable computer makes an ideal portable terminal. Units such as the TRS-80 Model 100 feature an LCD display, full-size keyboard, built-in telecommunications software, an RS-232 port, and a printer port. All of this capability fits in a case the size of a three ring binder and weighs about the same. The entire computer is powered by 4 AA batteries for up to 20 hours. Supplemental power supplies are also available that allow for extended operation.

The Model 100 is very popular with packet operators, due to its reputation, low price, and availability on the used market. Its built-in telecommunications software features Xon/Xoff, download and upload, echo to printer port, and high baud rates. Many optional accessories are available, including a battery operated disk drive and printer, many software packages, and memory add-ons.

Other portable computers are also used with equal success, particularly laptop PCs such as my T-1000SE. Also, a battery operated hardcopy terminal is a possiblity. These units often feature built-in acoustic couplers for use with the telephone system. If the terminal has an RS-232 port, it can be connected to the TNC and used as a terminal. However, these units are usually classified as dumb terminals. The advantage of the hardcopy terminals is their extreme low price in today's used market.

The TNC should draw as little power as possible; 250 mA should be the maximum current drain considered for a battery operated portable station. Some manufacturers offer a version of their TNC with CMOS chips which draw much less power than their NMOS counterparts. They also generate less heat which is especially advantageous in a crowded portable arrangement. Today, there are several TNCs available that are designed for portable operation and draw very little power.

For VHF operation, a handheld is the most obvious choice. They are compact, battery operated, and can generate up to 5 watts of power. Some require a special interface to allow the TNC to control the PTT. An amplifier can be added for additional range. However, an amplifier can significantly increase the T/R (Transmit to Receive) and R/T turnaround time of the radio as well as drain copious amounts of battery power.

Any antenna system commonly used for FM phone will probably work successfully on VHF packet. Of course, when operating at a fixed location for awhile, you will probably want to put up an antenna with higher gain characteristics. I have had good luck with a regular rubber duckie antenna running about 2 watts is dense urban areas where digipeaters are readily available.

Batteries are the most obvious power supply for a portable packet station. Twelve volt dc gel-cells, while rather heavy, offer 3 to 6 amphour ratings and can be used to power most any station. The same power system can be used to run the TNC, radio, and computer. Also remember to bring along a battery charger.

HF operation is not very common in portable packet stations. Power requirements, size, and antenna space are the major restrictions to portable HF operation. Most of the HF rings that are used for packet operation are modern transceivers such as the Kenwood TS-430S. However, if you do manage to set up a portable HF station, be sure to get a multi-mode controller so you can take advantage of the more common HF digital modes.

Conclusion

This column provided a brief overview of the issues you will face when first contemplating a portable packet station. Many of you will find yourself in an enviable position by already having a laptop PC available. In these cases, you can simply add a small TNC (such as the Heathkit) and a 2 meter HT - pretty much duplicating my current system - and you'll be all set.

One issue that I did not choose to address is the necessary terminal emulation software for the portable PC that you select. I feel that is a subject best left to columns dedicated to a particular type of PC, rather than a general computers column. In most cases, the portables will be IBM compatible, allowing the user to select from most all the terminal emulation programs used on the desktop machines. However, if you are using a nonstandard laptop - such as some Tandys, NECs, and Casios to name a few - feel free to let me know what terminal programs you use. I'll pass the information on through this column.

If you have any questions or comments, you can contact me by US mail or E-mail on CompuServe (ID 72276,2276). ☐

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Buying a Computer for Antenna Modeling

(and other contest-related activities)

The microcomputer revolution of the past decade has been a godsend for the Amateur who designs and builds his own antennas. Antenna analysis programs, which only a few years ago were limited to military or commercial applica- tions, are now readily available for amateur applications.

Unless you are a computer enthusiast, buying your first computer can be an exercise in confusion. There are several types of computers from which to chose, and a tremendous array of peripheral accessories to match. If you are buying a computer to do antenna-modeling, there are several features to look for, and some which are not worth your money. The purpose of this column is to help you chose the right computer for your antenna modeling needs.

To IBM, or Not to IBM

The proverbial question in the micro-computer market is whether to buy an IBM PC-compatible computer (also known as an MS-DOS computer), or something else. Without going into great detail, your best bet is to buy an IBM-compatible computer simply because of software compatibility. There are other platforms which deliver impressive computing power (Macintosh, Amiga, etc), but there is nowhere near the volume of software available for them as for MS-DOS machines.

Before I get dozens of angry letters from owners of other computers with lists of antenna software, we need to make an important distinction between antenna design software and antenna analysis software There are many programs in the public domain (particularly for Commodore machines) which take an existing antenna design and specify dimensions for some user chosen parameter. This is antenna design equivalet to using the standard L = 468/FMHz equation to design a dipole, and does not require much computer power. On the other hand, antenna analysis requires elaborate alogorithms such as MININEC, W2PV, and so on, to predict the actual performance of the antenna. Such programs require computer power well beyond the capability of many popular computers.

Choosing the CPU

Now that you have dececided to buy and IBM-compatible computer, you are faced with hundred of choices from dozens of vendors when you try to decide which computer to buy. For the total computer neophytes out there, the IBM PC introduced in 1981 created a market for IBM look-alikes which has continued to grow ever since. Nowadays, any MS-DOS computer (referred to as "clones") should be able to run the large majority of programs marketed for the IBM PC.

The main criteria for a computer used for antenna modeling is computing speed. Computing speed is primarily dependent on (I) the type of central processing unit chip (CPU) which is the "brain" of the computer; (2) the clock speed that the CPU chip runs at (measured in MHz); and (3) whether a coprocessor chip is present (which we'll discuss later).

(cont'd on page 25)

RTTY News Frequencies...

Hams are involved in one way or another in listening activities. Most hams start in the hobby by listening to broadcast stations in the short wave spectrum and then have stepped up into Amateur Radio.

With the advantage of the many multimodes TNCs on the market today, the fellow who loves packet can push some keys in the keyboard and switch to FAX or RTTY reception and just listen where the action is!

With a little patience, you'll be able to catch news or press agencies when they are broadcasting to the commercial radio and television stations, as well as newspapers from around the world.

Scan the bands and try for yourself. Stations with day schedules can be found in thee following frequency ranges:

18.000 to 20.800 MHz
15.480 to 16.400 MHz
14.450 to 15.000 MHz

Afternoon and Evenings:

6.760 to 7.400 MHz
7.400 to 8.120 MHz
10.000 to 11.160 MHz

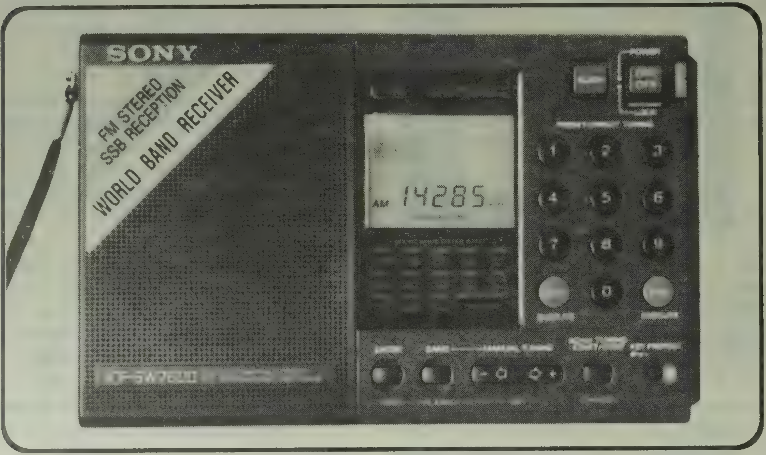
Outside of this range you can find other news, telegrams, utilities, and other services such as military stations. Their frequencies are:

2.300 to 2.500 MHz
3.400 to 3.500 MHz
4.000 to 4.750 MHz
5.060 to 5.950 MHz
6.200 to 7.000 MHz
7.300 to 9.500 MHz
9.775 to 10.000 MHz
10.000 to 11.700 MHz
11.970 to 14.000 MHz
14.400 to 15.100 MHz
15.450 to 17.700 MHz
17.900 to 21.000 MHz
21.700 to 25.600 MHz
26.150 to 26.950 MHz

Try it at different hours using this handy reference so you can listen to the different news agencies.

Source: RadioScan Magazine

A Review of the Sony ICF-SW7600



The NEW Sony ICF SW 7600 receiver appears to be intended as a replacement product for the ICF 7600D, 7600SD, 2002 and 2003 models. This receiver is almost identical to the older ICF 7600 /2000 series in size and function with some much needed enhancements. The radio is approximately 191 X 118 X 32 mm in size and weighs 615 grams including four AA batteries.

The case is designed with rounded corners instead of the square edges of the older versions. The case color is almost black. This is a sore spot with me as the radio often spends long hours plastered against hotel windows for better reception with the internal whip antenna. A black radio get HOT when the sun beats on it! The new version seems lighter in weight than the older versions and of somewhat less robust construction.

The weight difference is probably due to a lower speaker magnet weight. Speaker quality seems worse than the older radios but is still quite good. Battery life is specified by the manufacturer at 10 hours for four hours a day at normal volume. This estimate is conservative. My initial results with alkaline batteries is much better.

The US version receiver I purchased in the U.S. covers 150 Khz to 30 MHz AM/USB/LSB and 76 to 108 MHz FM (FM Stereo with included pill-type headphones). Reception modes are switch selectable: AM, AM with fine tuning, Upper Sideband (USB), and Lower Sideband (LSB). FM Reception is automatic in the FM band. Within the FM band the fine tuning is disabled. Fine tuning is enabled (mandatory) in USB/LSB modes. A local/DX switch is provided to prevent receiver overload. Volume control is via a slide potentiometer on the right edge of the radio.

10 key-selectable user-programmed stored channels are provided in non-volatile memory backed-up by the AA batteries. Batteries can be changed without memory loss. A clock is provided in 24 hour format (only) and can be set accurately on-the-second. The display is an LCD panel (approximately 2 X 3 cm) and provides frequency to 1 KHz and time to 1 minute in addition to other functions. The clock is displayed when the radio is off. a backlight is provided. When the backlight button is pressed a green electroluminescent panel provides a dim green background for the display for approximately 15 seconds. The backlit display is quite readable in total darkness (only). The backlight cannot be turned on all the time.

An "on-alarm" function allows the user to set a time that the radio will turn on and receive the last selected frequency. Only one alarm-time/frequency can be selected at once. I have not determined whether the alarm will repeat on a 24 hour basis or whether the radio will turn off after a specific time after alarm activation (as in the SLEEP option). A sleep key can be activated that will turn the radio off approximately 65 minutes later. When the alarm goes off it can also turn on a recorder via a jack that provides a contact closure type output to start a tape recorder or other device. When the radio is turned on manually the recorder enable is also turned on. There is no provision to turn a beeper on in lieu of the radio upon alarm startup. This is a problem in locations where you have no radio stations to listen to at wakeup time (take a separate alarm clock when you travel). A separate tape output jack provides 0.775 mV at 1 K-Ohm output impedance.

Fine tuning is accomplished via a small edge-wise mounted potentiometer protruding from the upper-right edge of the radio. Fine tuning allows a +/- 5KHz (approximate) range. My experience shows the fine tune allows sufficient overlap in LW and SW bands to qualify the radio for continuous coverage. It appears that separate filters are provided for USB and LSB operation. USB and LSB reception modes are switch selectable. Automatic SW broadcast bands can be selected from the front panel via a band select button. Other bands are accessed by direct frequency entry or frequency step tuning. A scan feature is available in all modes/bands that scans upward in frequency from the present frequency and stops at occupied frequencies. MW step size can be selected by a switch in the battery compartment for 10 KHz (for USA) or 9 KHz (for outside USA) steps. Synthesized steps for the US version are:

* LW: 150-528 KHz 3KHz steps
  (Saudi Arabia version to 285 KHz only)
* MW: 531-1610 KHz
  (10 KHz steps selected for US)
* MW: 530-1611 KHz
  (9 KHz steps selected for outside US)
* SW: 1615-30000 KHz 5 KHz steps
* FM: 87.5-108 MHz 50 KHz steps
  (Versions for France, Germany, Scandinavian, and Saudi Arabia)
* FM 76-108 MHz 100 KHz steps
  (All other versions including USA)

Automatic SW band front panel key-select is available for 120, 90, 75, 60, 49, 41, 31, 25, 21, 19, 16, 13, and 11 meter SW bands. Manual Frequency step tuning is accomplished by two keys on the front of the radio. One key is for up-frequency, the other for down. When you hold either key the radio steps in sequence at a rate that is just right for listening for signals. It appears the AGC circuitry is properly designed to allow tuning this way.

The radio includes an extendable whip that (for the moment) seems mechanically robust (the antenna-mount parts that broke on the older ICF 7600 series seems to have been improved). An external antenna input jack is provided along with a small plug that allows the user to connect antenna and ground leads via screw terminals. An external antenna accessory is supplied with a convenient self storing reel and hanging clip. This accessory antenna is attached to the existing antenna by sliding a coupling loop over the base of the whip. Performance of this loop coupled antenna seems to be worse than an equivalent length of wire plugged into the external antenna jack. Therefore, some users may opt' to replace the loop coupler with an antenna plug.

The headphone jack is compatible with "walkman" type headphones and is 16 Ohm impedance. This is to provide FM stereo within the FM band. The internal speaker is 77 mm in diameter and provides very good audio performance. The headphone output is automatically monaural outside the FM band.

New Features over the older 7600, 2002, 2003 Models:

- Separate USB/LSB modes

- Improved fine-tuning. Even though the tuning potentiometer is situated as in the older radios; the new potentiometer is of higher quality. No warble tuning due to a dirty low quality pot. However, the fine tuning rate is the same as in the older versions of this radio and is (in my opinion) too sensitive. Tuning Ham transmissions, whether CW or sideband are no problem.

- Ability to mechanically lock OFF the power button to prevent battery drain by inadvertent turn-on during transport.

- Ability to lock OFF the keys during while the radio is on (key protect). This allows you to handle the radio without worrying about changing the setting if you mash the buttons.

- SW broadcast band listing printed on the front panel.

- A stand for the radio that can be pulled out from the rear. Although this was sorely needed in the older versions to allow the speaker to "breath" via the back panel opening grid and therefore provide much improved audio; this radio has no rear acoustic openings. Therefore, the stand is simply a welcome ergonomic convenience. Like the previous versions a World map with timezones is printed on the rear panel.

- Stereo FM reception (useable only with the headphone jack), and (supplied) stereo headphones.

- The external antenna (supplied) on-a-reel. Sony should offer this item independently!

- Lighter weight and rounded case corners. This will reduce damage due to hard handling during travel.

- A carrying case. The patent leather case is reasonably thick and encloses the radio only. No accessories or the excellent Sony Wave Handbook frequency directory will fit in the case. In any "case" the radio will fare better in travel.

- No need for separate (two AA Cell) computer batteries. Changing the main (four AA Cell) batteries does cause loss of memory.

PURCHASING THE ICF SWL 7600
(Must Read!):

Be Careful! The NEW 7600 has the same general model name as the OLD 7600 (ICF SW 7600 for the new vs. ICF 7600 for the old). You can make sure the radio you're buying is the NEW model by ensuring that the radio you are buying have keys on the front panel are round, NOT square! Again, the front keys are ROUND on the new version, not SQUARE.

The Radios available in the US have a 120 VAC adapter ONLY. International (and so called grey-market) radios have a 120/220 VAC adapter. If you travel you should get the 120/220 VAC adapter version. Be forewarned that the 120/220 VAC adapter equipped models will be Grey-market goods and will probably not include a U.S. warranty. This however may be a good thing since Sony service on these radios in the U.S. is worse than throwing them away (my experience with attempting US repair of 7600D and SW1 receivers I own). Grey-market radios (unlike camera lenses) should be no problem quality-wise. You may be able to purchase a 120/220 VAC adapter from Sony America (see below for address etc.). Alternatively I get around this problem by purchasing 120/220 VAC adapters outside the US. It seems that 120/220 VAC switchable adapters are not approved in the US (perhaps by UL). Sony also offers optional accessories for the radio such as a car battery adapter, recorder connecting cord, and two external active antennas; one for SW/LW and an other for LW only. Consult the manual for details.

Some prices as of 8/90 in the US from my limited look-around:

- EEB (Electronic Equipment Bank, 323 Mill St., N.E., Vienna, Virginia, 22180 USA. Tel. 703-938-3350 or (inside US) 800-368-3270. $219.00 USD. EEB advertises List Price as $259.00 USD. 120 VAC Adapter only.

- Ham Radio Outlet (HRO) 224 N. Broadway, Salem, New Hampshire, 03079, USA. Tel. 603-898-3750 or (inside US) 800-444-0047. $219.00 USD over-the-counter or mail order. US 120 VAC Adapter only.

- 42nd Street Photo, N.Y., N.Y. 800-221-0747. $279.00 USD. Note this vendor seems to have grey-market with 120/220 VAC adapter.

- Sony America, Sony Drive, Mail Drop #T1-11, Park Ridge, New Jersey, 07656. Tel. 201-930-7669, 714-821-7669.

In closing: My first impressions of the ICF SW 7600 are very positive. There is nothing on the market that can touch this receiver given it's size/weight/price factor. I have purchased the new receiver to replace an older ICF 7600SD purchased grey-market over five years age. This older SD model is getting pretty beat-up and has provided me with over five years of excellent service in more countries that I have space to list. Sensitivity, selectivity, and dynamic range for the new 7600 seem to be excellent. I have compared performance with a friend's ICOM R71 and my own R-390 and HRO-500 receivers with good results. I look forward to some aftermarket enhancements that may appear. In particular; a modification to allow external adjustment of the fine tuning control and a small self-powered audio filter for CW reception and/or additional 10 KHz hetrodyne elimination. □

by Dave Reynolds, WB4ONA

Source: CompuServe's HamNet

Digital Digest

ACTION ON THE HAM BANDS

by Jim Mulvey, KS1A
60 Serenity Dr., Tewksbury, MA 01876

LOGic™ II

Personal Database Applications has released their latest ham radio software LOGIC version II, the follow up to last year's LOGIC I program. Available for the IBM PC, Commodore Amiga and Atari ST (a MAC version is due shortly), it features real-time and non-real-time logging for DXing, contesting and rag chewing. Plus QSL management, report and QSL writing, award tracking and more.

I'm familiar with a handful of software packages for ham radio and found LOGIC II to be a bit more complicated to set up than the others. However, a very thorough manual guides you through the setup and you feel comfortable after a few good hands-on sessions. The extra time it took me to work through LOGIC II is the result of these many features.

You pop in your latitude and longitude and LOGIC II cranks out a list of bearing and beamheadings for recall when a contact is entered in the log. I entered VP2VEC and the logging screen (there are several screens to choose from) immediately filled in the following information: 1) I hadn't worked the station before. 2) The HEADING is: 165/345 with a return of 348/168 degrees. 3) DISTANCE: 1698 KM: 2732. 4) LOCATION: Brit Virgin Is. 5) TIME DIFFERENCE: 0.0, 6) CONTINENT: NA 7) BUREAU: Y 8) THIRD PARTY AGREEMENT? N 9) CQ ZONE: 8 10) ITU: 11, and more.

Plus, right across the top you get the local time and date, and the current UTC time and date.

If you have a late model transceiver and a computer interface LOGIC II will show the MODE, FREQUENCY and BAND you're using. There are also windows for QSL sent, QSL received, Power, QSL address, and who the OPERATOR is at your station for this contact. LOGIC II supports up to four radios simultaneously. You can pick the desired radio from the logging screen.

It's a nice logging screen. I really like being able to type a callsign and automatically get all the related beam headings, zone info, country name etc., filled in automatically. If you've worked the station before you are notified, and the information from previous contacts is filled in. You may open a "previous QSO" window to show all these past contacts with the station you're working.

The LOGIC II prefix table contains over 700 callsign prefixes. You can get a display of all the related information by just entering a state, or a callsign. And, for some countries, information is available down to areas within the country! All prefix and country tables give you the ability to add and edit.

I was also pleased by the HELP FUNCTION. Whenever you need to make a key selection anywhere in LOGIC II, the choices are displayed at the top of your screen. And, you can always press F1 for help at any time.

Viewing your logbook is done by paging through in chronological order, much in the same way you'd page through a paper log book. Other choices include viewing your log alphabetically, specifying values to watch, or by searching any of the fields separately or together.

Once you've entered all your contacts into the log, LOGIC II uses this big database with modules for award tracking and report writing/ QSL writing. LOGIC II analyzes your data and prints reports for just about any award. Such as, Worked ALL STATES, DXCC, etc. You can set up the awards tracker for anything you'd like: County Hunting, WAZ, Worked All Grid- Locked Grid-Squares, etc.

LOGIC II lets you print a list of all "NEEDED" countries for DXCC (and more) and shows whether or not you've worked it and QSLED it. The program comes with tables for DXCC, WAS, CQ Zones, ITU Zones, US Counties and Russian Oblasts.

The REPORT WRITER feature lets you print your logging data in your own customizable ways. Print your own logbooks and QSLs with counting and totalling, control of printer enhancements like bold, italics, underline, letter quality and condensed print.

Back to the log screen. You don't have to keep the fields provided by the program. If you wish to have a field for OPERATOR'S BRAND OF SNEAKERS: you may add it!

LOGIC II contains a comprehensive, flexible contesting system that will automatically dupe and score just about every contest. You specify what fields should appear on the screen and the next serial number to be assigned. You can keep the contest log separate or combined into your regular log.

LOGIC has a built-in gray line propagation aid that calculates sunrise and sunset time for every entry in the prefix table. When you decide to work a certain area of the world, let LOGIC II aim your antenna on either the short path or long with hookup to your computerized rotor.

If you use another logging software package you can import/ export all your data to LOGIC II! This includes built in conversion programs for grabbing data from the K1EA contesting package as well as others. Nice!

The manual is a clear, 70-plus pages. And there are many, many more features like QSL MANAGER LIST (that you enter), a word processor, a good data-backup system and more.

FINAL IMPRESSIONS: I like the completeness of the LOGIC II package. PDA is a company who knows their way around databases. And they put that to use with your main logging data pool and the award tracker, countries list, etc. My only disappointment was the lack of support for TNCs. PACKET and the DX spotting nets have become essential to many of us. It would be nice to have a window, if even a three-line window that would display the DX spots as they come over from packet. Otherwise, this is a very fine package.

LOGIC version II from Personal DataBase Applications sells for $79 US, including priority mail shipping and air mail to Canada and Mexico. A hard drive is required for this version reviewed, version II.

Personal Database Applications,
2616 Meadow Ridge Drive,
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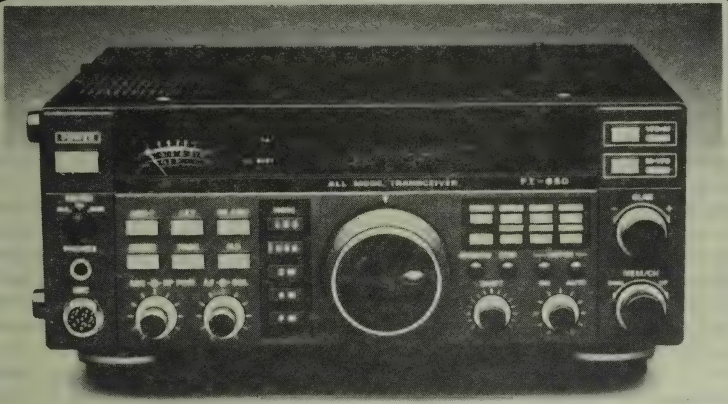

New from YAESU

The new FT-650 HF transceiver features the latest in DDS (Direct Digital Synthesis) for superior receiver performance and designed to operate on the 24/28/50MHz bands. Allowing transmissions on less crowded and noisy frequencies.

This transceiver packs 100 watts of power output in a stream-lined compact case. A flip-out handle makes it the perfect portable, while a built-in power supply (AC or DC) lets it function as a base station.

Features include, 99 channel memories; 4 programmable scan memories and 2 priority channels; all mode (SSB, CW, FM & AM) operation; RF preamp with 5 MHz bandwidth BPF, veractor tuned; extended receiver (24.5 to 56 MHz) coverage; automatic seeking IF Notch filter and 100% continuous operation duty cycle. Optional accessories availabl are DVS-2 Digital Voice Recording Module, MD-1B8 desk-top microphone and SP-5 exernal speaker with AF filter.

Availability is slated for early October release at all Taesu amateur radio dealers. A suggested retail price of $1599.00 has been established.

For more information on this, and other Yaesu products contact your local Yaesu dealer or Yaesu USA, 17210 Edwards Road, Cerritos, CA 90701.

Kantronics Releases New 3.0 Firmware...

for the KAM, KPC-2, KPC-2400, and KPC-4. All units are now shipping with the new release. If you purchased any of the above units after July 1, 1990 you will be entitled to a free update. To receive your update, mail your warranty card and a photo-copied proof-of-purchase to Kantronics, 1202 E. 23rd St., Lawrence, KS 66046. Units above the following serial numbers already have the 3.0 firmware.

New features in the 3.0 update include:

PBBS Changes
The PBBS in all units now supports "reverse forwarding" of private and traffic messages. Enter your messages into your mailbox, then arrange with your local full-service BBS to reverse forward them in the middle of the night when the frequency is not so congested. Also simplified is the use of the PBBS from the local terminal. No more pbl, pbr, pbk, pbs; just issue a connect, and use it like you would use a remote PBBS. Commands are handled by the local unit and not transmitted.

REROUTE
is a new command that lets you change the "to" field of a message already in the mailbox.

NAVTEX/AMEX (Kam only)
The KAM now supports the NAVTEX message format, and remembers the last 256 messages received (50 from any one station). This also supports the AMTEX format being used by ARRL to transmit their bulletins each day. Copy only those messages you are interested in, and avoid duplicate copies of the same bulletin automatically.

AMTOR 625 (KAM only)
The KAM now fully supports the new Part 97 rules for AMTOR allowing for 7 character or 9 digit selcals. Also enhancements for relinking and busy signaling to other stations. In FEC mode, TXDFEC has been added, which allows you to specify extra phasing characters at the beginning of your Mode B transmission.

RESTORE
is a new command that allows you to restore permed parameter values.

HOST MODE
is now included in the KAM and KPC products, allowing special terminal programs to access all features of the TNC while operating in packet mode.

SOFTWARE CARRIER DETECT
has been added to the KAM and KPC-4 and improved in other units. By turning this on you can run open squelch and detect weaker signals. Carrier will only be detected when packet signals are present.

Various other features have also been included or upgraded in version 3.0. All units above the following serial numbers already have the new firmware.

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KAM	100-08183
KPC-2	120-03285
KPC-4	110-02202
KPC-2400	130-01280

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Digital Digest

LANLINK APPLICATION NOTES

by Joe Kasser, G3ZCZ

P.O. Box 3419 • Silver Spring, MD 20918

Flow Control

This application note discuses the control of the flow of characters between the Computer and the Terminal Node Controller (TNC). The method of control of the flow of characters between the TNC and the computer is called Flow Control. It is also used to control the flow of characters to the computer's display. Before looking at each of these flows, let's take a quick look at the interface between the computer and the TNC.

The Interface.

The interface between the computer and the TNC consists of a cable with connectors at each end. It is commonly called an RS- 232 cable, because the signals conform to the RS-232 specification (at least they are supposed to). The cable contains one wire which carries data from the TNC to the computer, one wire which carries data going the other way, and a common or ground wire. This is the minimum cable. Without these three wires, data cannot flow in both directions.

As long as the data entering either the computer or the TNC is coming in slower than the device can process it, there is no problem. However when the data comes in faster, it overflows and characters can get lost. For this reason, almost every program and TNC contains a data buffer to catch and store the characters as they come in. This is well and good, but data still has a habit of coming in too fast.

In order to stop the overflow from happening, flow control is used. This is a mechanism used between the computer and the TNC whereby one of the devices tells the other to stop sending when it senses that its buffer is full, and then later, when its program has depleted the buffer, tells the other device to start sending again. This flow control can be used in both directions.

Hardware Flow Control

There are two types of flow control; hardware and software. The RS-232 cable has special wires dedicated to hardware flow control. Thus use of hardware flow control requires extra conductors in the cable. In hardware flow control a 'Clear to Send' voltage level is placed on the wire by the receiver. The sender checks that level before sending any character, and only sends characters as long as that signal is present. Should it change state, the sender will wait until it reverts to the clear to send state. Since the RS-232 cable is bidirectional, there are two such lines, one used by each device.

The 'XFLOW' parameter is used to tell the TNC which flow control approach to use. If XFLOW is ON, then software flow control is used, if XFLOW if OFF, hardware flow control is in effect.

Software Flow Control

In software flow control, the signalling is done by two characters reserved for that purpose. They are usually the Control-S (^S) and Control-Q (^Q) characters. When the receiver has enough data, it sends a ^S (Stop) character to the sender who then stops transmitting and waits for a ^Q (start) character before continuing. When the receiving device is ready for more characters, it send a ^Q, and flow is restored.

Binary Data

Software flow control has the advantage of only needing the three wires in the cable, but has problems when binary data is being transmitted along that interface. The ^Q and ^S are binary codes. As long as only ASCII text flows along the cable, binary codes are never seen and the ^S/^Q flow control is usable. Once binary characters flow, the receiving device cannot tell if a received ^S is part of the data or is a flow control character. Under these circumstances it stops receiving and waits for a ^Q, which if binary data was flowing, may never come, and the program seems to hang up.

The original TNC software designers recognized that such a problem might occur, and put a filter parameter in the TNC instructions to tell the TNC to filter the received characters in the data stream and block various characters from being passed on to the computer. Thus PK-232, TNC2 and MFJ1278 users could set 'MFILTER 19' to block the ^S character from being passed to the PK-232 if it was received while monitoring an on-the-air packet. KAM users could use the 'FILTER ON' command to achieve the same effect.

Flow Control in LAN-LINK

All versions of LAN-LINK upto and including 1.55 used software flow control. In the early days of packet radio there was little if any binary data flowing on the LAN. A very few stations were using YAPP to transfer binary files. Then along came NET/ROM which signalled the state of the network to other nodes by means of binary information. Stations using LAN-LINK hung up when the binary information contained a ^S, if they had not set their TNC to filter out the ^S before passing the received characters to the computer. LAN-LINK version 1.56 and subsequent versions use hardware flow control, hence they ignore the ^S and ^Q and don't tend to hang up when monitoring packets containing binary data.

Display Flow Control

The TNC has the capability to echo back characters as they are received on the RS-232 interface. The TNC usually has this facility switched ON when powered up. This facility is controlled by the 'ECHO' parameter. When 'Echo On' is set, the TNC echoes back on the RS-232 interface any character received on the interface. If it is receiving characters on the radio interface at the same time, the characters will be sent down the RA-232 line as they are received, namely mixed together. The first dumb terminals and computer software used to interface the TNC only had one screen or window to display. To stop the characters being typed at the keyboard from appearing on the screen mixed together with the characters coming in from the radio, type-in flow control is used. The type-in flow control parameter is 'FLOW'. If FLOW is ON, any character received on the RS-232 interface (typed at the keyboard) will stop the TNC from sending characters on the RS-232 interface to the computer until you type an 'Enter character'. If you forget about the FLOW parameter and it is ON, The TNC will not send any characters to your screen until the TNC buffer fills up, and the system will appear to have hung up. These days, with LAN-LINK and two separate windows for incoming and outgoing characters, set 'FLOW OFF'.

Summary

To make everything work properly with both flow control and type- in flow control, make sure the following parameters are present in your LAN-LINK.SYS file, AND THEY ARE

LOADED INTO YOUR TNC.

FLOW OFF XFLOW OFF STOP 00 START 00 XON 00 XOFF 00

73, Joe G3ZCZ

LAN-LINK is available from the author. For an evaluation copy, download it from Compuserve or send $5.00. On the other hand, send $35.00 for a registered copy which will entitle you to at least one free update. When you write in, say where you saw this Application Note. ☐

Nostalgia And The Challenge...

Since my Amateur career began in 1961, an amazingly brief 28 years ago, it might be fun to compare a typical station then to one now. The newcomer might be surprised and enlightened; the more experienced might just feel a twinge of nostalgia.

AM was still king and SSB experimentation was relegated to the very top 10 to 20 kHz of each band. Probably half of the rigs were still proudly homebrewed. The airwaves reverberated with such now defunct terms as "Heising modulation," "pair of 813s modulated by a pair of 811As," "Windom" and "end fed Zepp." A few rugged individuals even utilized crystal control exclusively, bellowing at any unsuspecting frequency agile newcomer that this was HIS frequency, and the upstart was somehow violating an unwritten FCC edict.

My meticulously assembled Heathkit DX-40 75W crystal controlled Novice transmitter and National NC-60 five tube receiver, which was my combination Christmas and birthday gift for that year, were all set for another 40M adventure. That was my favorite of the three Novice bands. I never was able to hear any signals on 15 and couldn't possibly fit an 80M antenna onto the urban eastern Pennsylvania rowhouse lot of my parents.

The choice was easy. Audio filters were virtually nonexistent, IF filtering was only available on the very expensive Collins radios. Twenty to 30 kHz of signals mixed together all at once. Since the 40M Novice band was only 50 kHz wide, it wasn't difficult to hear any other crystal controlled station who might be calling, and visa versa. This was very fortunate, as the Novice ticket only allowed crystal control with a maximum of 75W input. I was running a Novice "kW." Most others ran considerably less. CW, the only mode allowed, was sent with a hand key; bugs were too expensive and electronic keyers were yet to be developed for a year or two. Too futuristic for me as the ticket was only valid for one year and then was NOT renewable.

QST illustrated a transistorized rig that actually ran almost a watt. The minimum wage was 8.75/hour; the transistor cost $8.30. A 6146 went for $2.50. WWII surplus still abounded, and more than one fellow Novice could be worked in an afternoon using an ARC-5, BC-348 or the surplus, top of the line, luxurious Collins ART-13.

Today's scanning, memories, digital readout and 12-volt operating were only dreams that manifested themselves as so many doodles on a scrap piece of paper during a boring history or English lesson.

So how did we get from there to here? We met the challenge of developing, building, testing and buying each new generation of radio until yesterday's dream rigs became today's norm. Each of us is responsible for furthering the Amateur Radio tradition of pushing technology onward through utilizing any or all of these four stages in our day to day operating.

Just compare your present radio system with the 1961 version. The economic advantage of buying versus building has changed, so it may not be quite as obvious as in years past, but the challenge is still being met.

by Brian O. Kassel, W5VBO
excerpted from Worldradio Magazine

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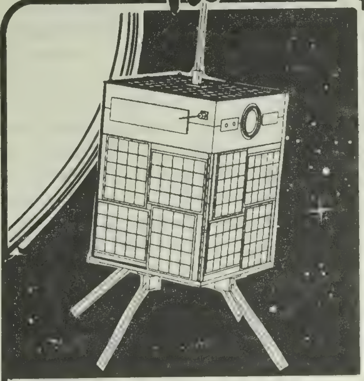

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Radio Sidekick

Pat Bouldin, KM5L, has written one of the best programs I've seen for a dedicated DXer or DX contester. The program is simple to operate, but has many bells, lights and whistles. For openers, he recognizes that many of us are on packet. In the main menu, he has made provision for packet by leaving one of the options blank. You can be in his program and exit to packet with a few keystrokes. I recommend you go into his program to load your packet program and then go back to Radio Sidekick as needed. One bit of advice: Be sure your packet program resides in the same sub- directory as the Radio Sidekick program- for some reason, Pat's program will not recognize a directory change.

As to the program itself, right off the bat you're given the ability to add any new DX countries yourself, no updates have to be purchased! It's fast and will find any country by entering a call sign. It will give you the country name, range, beam heading, continent and what bands and modes you've worked that country on (assuming you've entered the appropriate info into the data base). If you input"Jap," for example, it will find "Japan" and give you the above information. The program will display or print contacts, either by date, QSL status, countRY or print your entire logbook! To enter data, Pat has simplified the process by already entering your CPU date and time. He allows room for comments such as QSL Mgr or any other data you may care to enter. Updating country status is as simple as changing a "No for "Yes" and the program does the rest. You can then print (to screen or printer) your DXCC status, showing country, Bands(s), Mode(s), Confirmed status (worked but not confirmed) or an asterisk for not worked at all. You can list or print total country confirmation for each band. The best news is the price. At the time I purchased my copy from Pat, the price was $29.95. I have not contacted him to verify it that's current, but it's a very good program at a very reasonable price.

by Jim Lane, N5DC

Source: (NCJ) National Contest Journal

Packet-GOLD

A User's Review

I have read many messages about the AEA PK-88 and PK-232 and some of it's problems with the software that is provided with it. Let me tell you about a program that I have been using for two years, and has just been updated to support the new AEA ROM releases.

The program is Packet-GOLD, an upgrade from an earlier program called Packet-PLUS (Plus Multimode stuff). This is truly the most "friendly" program I've ever used. It is extremely easy, yet very powerful. It makes connecting, even multiple connecting, a breeze!

Packet-GOLD is true multi-connect software, able to handle up to 10 packet connections at the same time! Each connection is given it's own display page - no getting lines of text confused with lines from other connections! Just press F4 to switch from page to page and QSO to QSO. You can be casually chatting with someone on one page, while reading the latest poop from your local BBS on another page, while "auto-connecting" with someone several nodes away on another page. The program tells you if you have received any new text on a page, so you'll know to check that page.

If you don't happen to be looking when I connect to you, Packet-GOLD can announce me by sending "DE KJ6YT" in Morse Code over the PC speaker. Neat!

There's also a separate page for monitoring what's happening on the frequency. Just press F2 and find out who's on, who's calling CQ, and who's DX! Your monitor screen works even while other stations are connected, and doesn't interfere with your on-going QSO's which remain undisturbed, each on their own page. You can also have the best of both worlds by using a split-screen with monitored packets in the upper part and the lower part dedicated to your QSO. Shift-F2 brings a running list (MHeard style) in a pop-up window. No other packet program has all this power!

One of the better features is it's file transfer capability. You can transfer files using it's special file transfer protocol, insuring error-free reception from computer-to-computer (unlike YAPP which just makes it from TNC-to-TNC). Using Packet-GOLD, you can request a directory of another station's file-transfer directory. You can even carry-on a conversation with that station during the transfer, along with all the other stations you are connected to.

Many of its functions use "point-and-shoot" (or pick-list) technology, which means if you can read, and know up from down, you're in business!

- Quick Connects. Press F7, you get a list of everyone you've taught Packet-GOLD how to connect to. Use your cursor keys to select who you want, press ENTER.

- Using NET/ROM is easy. The program does all the intermediate NET/ROM connect commands automatically, you don't have to sit there waiting for each node to connect. Let the program do that automatically. Connecting to N6CWF in arizona, for me it's: AGOURA VIA MVIEJO|PHX|N6CWF [F7]. The program gets me there automatically. When it connects to CWF, I see a QSO log, and his call -- name at the top of my screen.

- Brag Tape. Pick a text file, press ENTER, it's on its way.

- Send Text files. Same as above!

- Cut-and-Paste. Select a line, or several lines, from another connection, a previous connection, your monitor screen, or even earlier in the same connection -- and send it back out, save it on disk, put it in the editor and fix a word or two. Real power, and very simple.

- QSO log: Keeps track of names, addresses, station info, and the last date you connected. No more guessing, "is his name Herb?"

Packet-GOLD supports all PK-232 modes except FAX. This means it handles the maildrop, SIAM, NAVTEX, Baudot, Morse, Amtor.

In closing, this is BY-FAR the easiest and most powerful Packet Radio program. The authors apparently are looking at other TNCs, but for now, if you own a PK-88 or 232, this is the best program available.

Packet-GOLD is $49.95 and is available only from:

Interflex Systems,
P.O. Box 6418,
Laguna Niguel, CA 92607
Phone: 714-496-6639

I am not affiliated with Interflex Systems in any way -- I just want some of you PK-88/232 owners to enjoy some of the power I've enjoyed!!

If you have any questions, or in the unlikely event you'll need any help, you can write me at the address below. I'd like to hear from you if you try the program -- tell me what you think!

by Robb Topolski, KJ6YT
Source: CompuServe's Hamnet

(cont'd from page 17)

MS-DOS computers generally are marketed three ways: an "XT-class" computer (named after the original IBM PC-XT), "AT-class" computer (named after the original IBM PC-AT), or a "386" computer. An XT-class computer uses an 8086 or 8088 CPU chip running at a CPU speed between 4.77 MHz and 12 MHz. An AT-class computer uses an 80286 chip running at a CPU speed between 6 and 20 MHz. A 386-class computer uses an 80386 chip running a CPU speed between 16 and 33 MHz.

How do these facts relate to computing speed? An 80286 chip is typically two to three times faster than an 8086 or 8088 at the same clock speed, and an 80386 is two to three times faster than an 80286 for equivalent clock speeds. Computing speed is also directly related to CPU speed - that is, for the same CPU chip, doubling the clock speed cuts the computing time in half. These two parameters combine to make a tremendous difference in performance - a 33 MHz 80386 might calculate an antenna model 60 times faster than a 4.77 MHz 8088!

You might also see advertised different CPU types such as the NEC V-20 or V-30. The V-20 is a direct substitute for the 8088, and the V-30 is a direct substitute for the 8086. Either NEC chip is rated to be faster than its Intel counterpart for certain types of calculations, but the difference in real-life usage in rather small. The NEC chips are nice to have, but ignore the advertisements which make grandiose claims as to the speed improvements they provide.

Math Coprocessor

Virtually every MS-DOS computer ever made has a socket for a math coprocessor chip, which is an add-on chip optimized to perform arith metic much faster than the main CPU. The math coprocessor also speeds up operation by performing this arithmetic while allowing the main CPU to process other chores. Adding a math coprocessor to any MS-DOS computer provides a very significant speed increase since most antenna modeling software is designed to take advantage of it. Speed improvements of five to seven times is typical.

The type of math coprocessor chip must match the type of main CPU chip which your computer uses: an 8087 coprocessor works with an 8086 or 8088 CPU, an 80287 with an 80286 CPU, and an 80387 with an 80386 CPU. Also, the coprocessor chips are speed-rated in MHz. For an 8087 or 80387. the coprocessor must be rated equal to or greater than the CPU speed. For an 80287, the coprocessor must be rated equal to or greater than two-thirds of the CPU speed. The speed rating is only to ensure that the coprocessor can keep up with the CPU electrically - a faster coprocessor than necessary will provide no further improvement in processing speed.

Computer Features and Peripherals

There are several other decisions while buying an MS-DOS computer as to some of the optional features that are available. These other options are of l ittle conse- quence for antenna modeling applications, but can affect the ability of your computer to run other programs.

Probably more than anything else, your choice of monitor and video card will influence how you feel about your computer as you are using it. Monitors are either monochrome (single color amber, green, or white) or color (multi-color). Color monitors can be either CGA-compatible, EGA-compatible or VGA-compatible type, the differences being in the number of colors displayed and the resolution of the screen. The video card installs in the computer and drives the monitor - it is important to get a video card which matches the monitor you have chosen.

Monochrome monitors are the least expensive, and provide excellent resolution for text applications. If your monochrome video card can handle Hercules-compatible graphics, then you can also display charts and graphs on the screen using most software. Color monitors provide an extra dimension through the use of multiple colors to display different information. CGA video is not visually pleasing in text mode, and is quickly becoming obsolete. EGA video looks very good for both text and graphics, and is the most cost effective way to color. VGA is even better, but both the monitor and video card are more expensive.

Your programs and data are store in the computer on some sort of disk drive - either floppy or hard disk. Hard disks are much faster for data storage and retrieval, but cost more. Hard disks are rated by how much data they will hold (in millions of characters or megabytes) and access time (in milliseconds). The common sizes are twenty to sixty megabytes, which is more than enough for a home computer. Avoid the temptation to go with a slow (but cheaper) hard disk. An 80286 computer should have a hard disk with an access time of 40 ms or less-for an 80386 computer, 28 ms or less.

Even if you buy a hard disk, you need at least one floppy drive to transfer data and programs into and out of your computer. Floppy disks come in two sizes: 5¼ inch and 3½ inch. The 5¼ size is more common, but the 3½ size will hold more data per disk. Commercial programs are usually available in both sizes, but some stuff only comes on 5¼.

You will likely want to print out the results of your antenna modeling, in which case you will need a printer. Most of the data is text, in which case any printer will do. Many programs will provide graphs or plots of the antenna pattern, in which case your printer should be capable of Epson-compatible graphics.

A Recommended Configuration

As with most things, when shopping for an MS-DOS computer, you get what you pay for. Similarly, capability costs money - how much capability can you afford? At K8CC, most of my antenna modeling has been done on an old 5-MHz IBM PC (8088) with an 8087 coprocessor. Gradually, I became spoiled by the faster computers used at my place of employment, so this summer the plastic money card came out and I am now the proud owner

(cont'd on page 29)

Digital Digest

IBM ARENA

by ***Jonathan L. Mayo, KR3T***

3908 Short Hill Drive • Allentown, PA 18104

The Coprocessor

and other bits of information

Intel Coprocessor Chart

Microprocessor	Coprocessor	Price
8088/8086		
4.77 MHz	8087-2	$ 90
8 MHz	8087-3	$115
10 MHz	8087-10	$155
80286		
8 MHz	80287-6	$150
10 MHz	80287-8	$200
12 MHz	80287-10	$240
80386SX		
16 MHz	80387SX-16	$280
20 MHz	80387SX-20	$310
80386		
16 MHz	80387-16	$310
20 MHz	80387-20	$350
25 MHz	80387-25	$440
33 MHz	80387-33	$540

These are all approximate prices. Coprocessor prices often fluctuate as much as DRAM prices, so get a current quote. I recommend ordering coprocessors and memory from I.C. Express (800) 877-8188. They always have excellent prices and offer great service. You can find their ads in Computer Shopper as well as in the back of PC Magazine.

Welcome back to IBM Arena - your one stop source for information and ideas on using your IBM compatible PC in your amateur radio digital communications station. In the previous IBM Arena, I discussed ideas for future column topics. I'd like to give you a brief update on what I'm working on for future issues.

I have contacted several vendors of IBM PC computer control programs for amateur radio transceivers. I now have a copy of Datacom's transceiver control program. They also sent along a computer interface for my Icom 271A. Unfortunately, my 271A apparently needs a new internal memory backup battery and is not operational. Once I get the Icom up and working and receive a few more programs, I'll prepare a column or two on this topic.

Satellites are of great interest to most computer equipped digital operators, and I hope to cover some amateur satellite related programs. There are several satellite tracking programs for the IBM PC as well as programs designed to "decode" specific satellite's telemetry reports. If you read my Computers column in the July/August issue, you may have noticed several of these programs in the file listings from the BBSs. Please let me know if you have a favorite satellite related program for the IBM PC.

Portable PCs

In the previous issue, I discussed the virtues of portable IBM compatible computers for portable digital operations. I want to advise you that 16 October 90 issue of PC Magazine contains additional coverage of portable PCs - this time with an emphasis on the more powerful 286 and 386SX portables. In case you aren't familiar with the 386SX, allow me to digress for a moment.

The 80386SX is very similar to the standard 80386DX microprocessor. Both chips are made by Intel, along with the 80286 and the latest 80486. The 386DX is a full 32 bit processor while the 386SX is a 16 bit processor. The 386SX contains the same internal "command set" as the 386DX; it just communicates with the other components in the PC in 16 bit chunks rather than 32.

Because of this, the 386SX is not as fast as the 386DX at equivalent processor speeds. The advantage of the 386SX lies in the fact that it is a little less expensive to use 16 bit support chips on the motherboard. The 386SX and its support components also draw less power than a full-blown 386DX system (due to the 386SX's CMOS construction), so the 386SX is more popular than the 386DX in battery powered portables.

If you use a desktop PC extensively, as I do, I honestly believe that you will get a great deal of productive use out of a small battery powered portable. I recently spent an extended vacation in Georgia that would have been all but impossible without my Toshiba 1000SE laptop. The Toshiba allowed me to keep up with my E-mail, send Faxes, do some writing, and, of course, operate portable packet. Because of my laptop, I really didn't get all that far behind while I was away.

Please see my Computers column in this issue for more information on using portable PCs in a portable digital communications station. Also, the IBM Arena in the July/August issue contains a thorough discussion of portable PCs. But, for now, let's leave the topic of portable PCs behind and delve on into another area of IBM compatible computer hardware that is of importance to amateur radio PC users - coprocessors.

Coprocessors

Whenever a PC is used to "number crunch" a coprocessor becomes a valuable accessory for the PC. While many users will never utilize the features a coprocessor provides and thus don't need one, in serious amateur radio use a coprocessor is worthwhile. Technically speaking, when I say "coprocessor" I mean "numeric coprocessor". Other personal computer systems can have true coprocessors, but a standard IBM PC compatible PC has only one microprocessor. The numeric coprocessor is simply an additional IC that works with the microprocessor to speed up complex numerical calculations.

Speed is the key word when considering a coprocessor. All a coprocessor gains you is time. The standard microprocessor can emulate the intricate instruction set in a coprocessor; however, the microprocessor is very slow compared with the same operations performed with a coprocessor. The microprocessor emulation is so slow that some programs (such as AutoCAD and PSpice) are designed to run only on PCs equipped with a coprocessor - otherwise they would be too slow to be usable.

If you just use your PC as a terminal emulator, you have no need for a coprocessor. However, if you use satellite tracking programs, antenna design software, and/or CAD programs, a coprocessor will be a valuable addition to your PC - as you may have already discovered. The easiest way to find out what coprocessor your PC requires is to check the owner's manual. But having an understanding of the various coprocessors for the IBM PC compatibles is a good idea, so I'll discuss the available coprocessors in this column.

There are several Intel microprocessors currently powering IBM PC compatibles. These are the 8088, 8086, 80286, 80386SX, 80386, and the 80486. These microprocessors are available in a wide variety of speeds - from a low of 4.77 MHz to a current high of 40 MHz. There are also many Intel clone microprocessors in some IBM PC compatibles. These include the NEC V-20 & V-30 as well as the Chips and Technologies (C&T) and Advanced Micro Devices (AMD) 286 chip sets.

Each microprocessor has a specific coprocessor that is designed to work with it properly. The Intel coprocessor designations follow the microprocessor designations closely. The coprocessor for a 8088 microprocessor is the 8087 coprocessor. The 80286 microprocessor takes a 80287, and the 80386 takes the 80387. The 80386SX takes a 80387SX. The 80486 contains a built-in numeric coprocessor; however, there is an additional coprocessor for this chip, although most current 486 motherboards are not designed to accept it. Most of the IBM PC compatibles utilizing a clone microprocessor will work fine with the equivalent Intel coprocessor, but check the owner's manual to be sure.

Once you know what model coprocessor you need for your PC, you have to select the correct speed rating. For the 80386 and 80386SX microprocessors, this is an easy task. Simply select the 80387 with the same speed rating as the 80386(SX) in your PC. The speed is commonly tacked onto the end of the 80387 designation; thus, a 20 MHz 80387 for a 20 MHz 80386 PC is designated 80387-20. And a 80387SX-16 works with a 80386SX-16. As an additional example, my 20 MHz 80386 PC contains an Intel 80387-20 coprocessor.

Things are a little more complicated with the 80286, 8086, and 8088. The 80287s are sometimes run at 2/3 the processor speed. Thus, the proper 80287 for a 8 MHz microprocessor is a 80287-6. A 80287-10 takes a 80287-8, and a 80287-12 takes a 80287-10. There are some higher speed 80286 chips out, running at 16 MHz and even 20 MHz. If you own one of these souped-up 286s, you'll have to check your manual for the proper coprocessor. There are probably some 80286 PCs around that take a coprocessor of the same speed rating of the microprocessor, so be careful.

The 8087 coprocessor for the 8088 and 8086 microprocessor have a slightly different designation scheme. The 8087-3 is the correct coprocessor for a standard 4.77 MHz PC. The 8087-2 works with the "Turbo XT" 8 MHz 8088. And there is even a 10 MHz 8087 out for the latest 10 MHz 8088 PCs - it is designated in the more modern fashion 8087-10 (although you'll sometimes find it referred to as the 8087-1).

Keep in mind that there is no harm in using a coprocessor rated for a faster speed than the microprocessor. You can use a 80387-25 in a 20 MHz 80386 computer without any problems. It doesn't make economic sense to pay for the faster coprocessor when you don't need it though. However, it is definitely not a good idea to put a 80387-20 in a 80386-25 based PC. You will most probably experience a reduced coprocessor life span as well as the possibility of erratic operation.

There are also several other coprocessor options for the Intel and clone microprocessors other than the basic Intel coprocessors I've just covered. There are the new "clone" coprocessors such as the Cyrix coprocessors for the 80386. These "clone" processors typically claim to run 10% to 20% faster than the Intel chips. I've never tried any of the clone chips, so I can't verify or deny their claims.

On another level are the much more sophisticated Weiteks. The Weitek coprocessors are many times faster than the Intel coprocessors; however, they are not directly compatible. A program must be designed to work with the Weitek coprocessor. Thus, many Weitek coprocessor systems come with a daughter board for mounting a regular Intel coprocessor for use when the Weitek is not supported.

Installing a coprocessor in your PC is relatively simple. Once you get the case off, look for a large, empty socket located near the microprocessor. In most cases, this will be on the back right corner of the motherboard, near the power supply. Carefully note the orientation of Pin 1 on the socket. Next, remove the coprocessor chip from its protective housing and locate Pin 1. Now insert the coprocessor chip into the socket with Pin 1 properly aligned.

Intel notes that most cases of inoperative coprocessors are the result of bent IC pins that result from a hasty installation. Make sure all the pins are properly placed on the socket before seating the chip. Once this is done, you will most probably have to move a jumper on the motherboard to let the PC know you've installed a coprocessor. On other systems, you may have to run the CMOS setup program again. Once again, check your manual for details.

Double check your work, then fire up the PC and make sure it boots Ok. Run Intel's CHKCOP coprocessor check program if you have a copy. CHKCOP is available on the Intel forum on CompuServe and also from Intel's own BBS (more in the next section). If CHKCOP or some other coprocessor sensitive application (such as Microsoft Excel) runs Ok or notes the presence of a coprocessor, you are in good shape and can close up the PC.

Some Interesting Ways To Contact Intel

Intel is one of the more customer responsive companies I've dealt with. Their coprocessors, along with all of their PC related expansion items, are marketed through their PCEO (Personal Computer Enhancement Operations) division. To get more information you can phone Intel at (800-538-3373) and speak with an operator during business hours.

You can also contact Intel's PCEO at any time electronically via modem and Fax. PCEO has a forum on CompuServe (GO PCEO FORUM or GO INTEL). You can also phone the Intel PCEO BBS at (503-645-6275). These are the easiest ways to get a copy of the CHKCOP program.

Faxes can be sent to Intel PCEO at (800-458-6213 or 503-629-7580 in Oregon). But, by far, Intel's most interesting information system is their FaxBack information retrieval number. If you have a Fax machine nearby, call FaxBack

(cont'd on page 32)

Digital Digest

MacHam World

by **Stan Horzepa, WA1LOU**
75 Kreger Drive • Wolcott, CT 06716

QLOG: A Logger for the MAC

When it comes to general purpose logging software for the Macintosh, there is not much of a selection. There are contest-specific packages, for example, System One Control's FDlog! for Field Day and ZCo's Six Shooter Contest Series for a variety of DX contests, but, until recently, if you were looking for something to log your non-contest contacts, you had to use a database or spreadsheet. Filling that Mac logging gap is a new offering from ZCo called "Qlog." I recently ran Qlog through the ringer and here are my impressions.

Inauspicious Beginning

After loading Qlog and its companion files on my hard disk, I started up the program and soon received an error message saying that an unspecified file could not be found. Qlog asked me whether I should "cancel" or "ignore." I chose ignore and the program completed initialization and was ready to use.

This error message persisted no matter how many times I started the program. Evidently, the program did not create the file after starting the program because it never could find it, however, this missing file did not seem to effect the operation of the software because, after plowing through the error message, the program ran smoothly.

You and UTC

After starting the program for the first time, you inform Qlog how many hours and minutes your Mac's clock differs from UTC. (I don't know about you, but, good ham that I am, my Mac is set to UTC at all times, so no adjustments were necessary.) Once time differentiation is set, you are ready to start logging.

Log Entries

Pull down the Log menu and select New to start a new log or add a new entry in your current log or select Revise to edit a previous log entry. The information that can be entered in the Log Entry window is very comprehensive. There are 25 pieces of information that can be entered for each contact including an area for comments that can be as short or as long as desired.

Don't worry; you don't have to enter 25 bits of information for each contact. The current date is entered automatically and, by pressing the Time On and Time Off buttons at the beginning and end of a contact, respectively, the on and off times of the contact are entered into the log. Your power, frequency, band, and mode entries remain the same from one log entry to the next until you specifically change them. Here is a list of all of the information that can be entered with each logging:

Call sign of the station worked.

Portable prefix/suffix of the station worked.

Signal reports received and sent.

Name of operator of the station worked.

Location of the station worked.

Names of as many as two other users of your station. These entries can be used for other information, as well, such as for 10-10 numbers, counties, etc.

Your station's power.

Frequency, band and mode used for the contact.

Date, starting and ending times of the contact.

QSL card received, sent and sent via who (the QSL bureau, manager, direct).

Last name and mailing address of the station worked.

Comments.

Although, you may never use some of these entries, but it is nice to know that they are there if you ever need them.

In addition, the Log Entry window displays your call sign, the number of contacts in the log and the number of the log entry currently displayed in the window. A control panel at the bottom of the window allows you to manipulate the Log Entry window. Besides the previously mentioned Time On and Time Off buttons, there is an "Old Qs" button, which lists any and all previous contacts with the station you are logging, "First" and "Last" buttons that display the first and last entries in the log respectively. A "Locate" button allows you to locate other log entries by simply entering a call sign or portion of a call sign. A "New" button clears most of the Log Entry window to permit you to enter a new contact and an "Enter" button saves the information in the currently display logging (the Enter key of your keyboard performs the same function). The "Cancel" button cancels the log entry function, while the "Browse" button opens a window that displays the actual log.

The Log

The log contains all of the information entered in the Log Entry window and this information may be sorted alphabetically according to call sign or numerically by date and time. Like many spreadsheets, the width of each column of information may be adjusted to the desired width and the order of appearance of the log entries may be adjusted as well by simply grabbing and moving a column of information to the location you prefer.

The maximum size of your log is dependent on the size of the disk you are using to store the log. The bigger the storage medium, the bigger your log. By the way, you can import and export log entries to and from other sources.

MACINTOSH SOFTWARE

Largest single collection of commercial ham radio software in the world! Morse and theory programs, relational database logging, contest program with digitized voice, satellite tracking with antenna control, gray-line and muf maps, world clock, packet, RTTY, Baudot, Fax and more. Attention Macintosh developers: please contact us to market your ham radio products through us.

ZCo Corporation
P. O. Box 3720, Nashua, NH 03061
(603) 888-7200 Fax (603) 888-8452

Hard Copy

Qlog includes a powerful Layout Editor that allows you to design the layout of your printed log, QSLs, and QSL mailing labels. Using a number of standard drawing tools, you can design a unique format that automatically imports the desired data from your stored log when you are ready for hard copy.

Qlog is a versatile logging program that will fit the needs of any Mac shack. I just wish I knew what file it was looking for every time I started it up. If it told me what it needed, maybe I could help it find it!

PUBLIC DOMAIN HAM RADIO SOFTWARE SOURCE

The following message appears on my local packet-radio BBS from time to time. If you are not on packet, you've probably missed it and, since it is such a good and inexpensive source of Macintosh public domain ham radio software, I am repeating the message here for you.

"Using a Mac computer with your radios? Join MacNet!

"Mail a formatted disk (800k) and a self-addresses, stamped disk mailer to: John Seney, WD1V, 144 Pepperidge Dr., Manchester, NH 03103.

"Include a text file on your disk relating your name, address, city, state/province, ZIP Code, call sign, home PBBS (if any), types of Macs used, types of radios used, types of software used, interests, projects, comments, etc. In return, you will receive a HyperCard stack "MacNet Roster" that contains your stats along with all the other MacNet members' stats. Imagine the Mac resource you will have! And our Mac software library now contains over 10 Megabytes of public domain ham software, all available free of charge to any MacNet member. The software is indexed by interest area. Full details accompany the MacNet roster." ☐

If you have news or information of interest to the digital amateur radio community, please let us know!

(cont'd from page 25)

of a 20 MHz 80386 computer with an 80387 coprocessor. I am totally pleased with my purchase, however the final tab was well over three kilo-bucks, which is more than many people are willing to commit to personal computing.

My personal favorite for cost-effective performance computing is the 12-MHz 80286 computer, which can easily be found with hard and floppy disk drives, and a monochrome monitor for $1200 to $1500. An 8-MHz 80287 coprocessor will cost in the low two-hundreds, so that a complete system with printer can easily be purchased for under $2000.

The performance of this system is very good. Actual speed times are a function of the particular software being used but the calculation times are very reasonable. There are no dead-ends or roadblocks with this system, and it presents a good value.

Choosing Your Dealer

The large PC clone market is such that there are numerous dealers who are more than willing to take your money and supply you with an MS-DOS computer. Many of these companies are small-time operations importing parts from the Far East and assembling their computers in a basement. Other companies are large, established firms with dealer networks. Customer Service departments and repair shops

Dealing with a small company is not too bad if they are local, since most will provide a replacement service for failed parts However, you still run the risk of buying from a fly-by-night computer company, and you can do a much better job of assessing their potential longevity if you do business face-to-face. Don't be totally afraid of mail order, however. Many of the larger firms are very reliable and provide excellent service.

Other Uses for Your New Computer

Dropping a couple of kilo-bucks for a computer might not make sense just for performing antenna modeling. However, there are many other uses for the computer. The most useful to the contester is computer-assisted logging real-time during a contest. For many years, I was an opponent of real-time computer logging, arguing that the computer would just get in my way and there was no room on the desk.

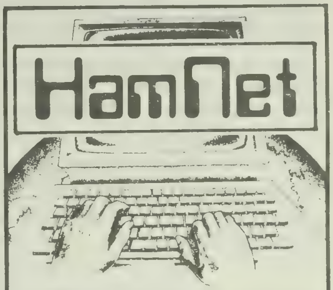
All that was changed by one man and his software: Ken Wolff, KIEA and his program, CT, for the CQWW, ARRL DX, CQ WPX, and WAE contests. Ken was the first to successfully combine the logging, duping, multiplier checking, and CW sending functions into one tool which enhanced, not hindered, the operator. CT is available through the Yankee Clipper Contest Club in New England, contact KC1EO at his Callbook address for details.

My conversion to computer logging was so total that I did not cherish the idea of doing some of my other favorite contests without the computer. Hence, I was driven to write my own program called NA for the NA Sprint, NA QSO Party, IARU HF Championship and ARRL Sweepstakes. NA is intended to present the same user interface as CT so that operation would be the same. If you're interested in a copy, it's free for sending a blank floppy to K8CC at the address on the masthead.

Although both CT and NA will run very well on an XT-class PC, for larger logs an AT-class machine is recommended. Our recommended 12-MHz AT clone will do an FB job for computer-assisted logging. The CPU speed is such that dupe searches and partial call checks are very quick, and the 40-ms hard disk gets data into and out of the data file with little fuss.

by Dave Pruett, K8CC 2727 Harris Road, Ypsilanti, MI 48198

Excerpted from: NCJ - National Contest Journal



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to get on packet...
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For FM, it's an excellent low-cost alternative for FM communication via your local amateur repeater. Great for control links too. And it's compatible with the RFC VHF 30-watt amplifier if you wish to out-reach your local repeater.

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KENWOOD Newsletter

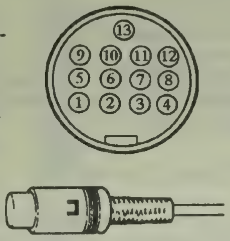
KENWOOD U.S.A. CORPORATION Vol. 1 Issue No. 3

Accurate and timely information for the active Amateur Radio Operator from Kenwood U.S.A.

Interfacing Digital Communications Equipment (Part 1)

This issue of the Kenwood Newsletter will begin a 3 part article on interfacing Data Communication devices to your transceiver. This would include Packet TNC's, RTTY, AMTOR, SSTV, etc.

Most modern KENWOOD transceivers have been provided with a terminal labeled ACCY2. This terminal provides an easy method of connecting your digital communication device to the transceiver. The physical layout of this connector is shown in the accompanying diagram. The table below details the use of the various pins provided on this connector. The table lists the connections for the TS-950S(D), but with minor changes can also be used for all of the present KENWOOD transceiver line.



13-Pin DIN Plug (E07-1351-05)
Viewed from the rear panel

ACCY2 Pin Assignments

Pin Number 1	SANO	Available on TS-950S(D) only. Stands for SUB receiver audio at a fixed level of 300 mV @ 4.7K ohms.
Pin Number 2	NC	No Connection
Pin Number 3	MANO	Main Receiver audio at a fixed level of 300 mV @ 4.7 K ohms.
Pin Number 4	GND	Ground for shield of coax cables attached to pins 1 and or 3.
Pin Number 5	PSQ	For TS-950S(D) This pin is used for connecting a TNC for use with packet radio. It is the Squelch Control line and will not allow packet communications while squelch is off. (Not used on some radios)
Pin Number 6	S-Meter	DC control voltage that varies in proportion to the S-Meter deflection (TS-950S(D) only).
Pin Number 7	NC	No Connection
Pin Number 8	GND	Chassis Ground
Pin Number 9	PKS	This pin is used to disable the front panel microphone during data communications. You should ground this pin whenever you are using any form of data communications.
Pin Number 10	NC	No Connection
Pin Number 11	PKD	This is the microphone audio or AFSK IN jack. The input level should be approximately 20 mV.
Pin Number 12	GND	Connect the shielded wire from the coax cable you attached to pin 11 here.
Pin Number 13	SS	This is the PTT line. Ground this pin to cause the radio to transmit.

Wiring the Cable

We have found the easiest method of assemblying the cable is to first determine which pins you will need for your hookup. Identify the pins using the drawing above and then cut off the pins you don't need. This will give you a little extra room when soldering the wires to the connector.

Before you solder the connecting wire slide a thin piece of heat shrinkable tubing over the wire so that you can push it down over the pin after the solder cools. Then after you are done soldering you can shrink it to help provide a good mechanical connection on the pins.

That's all the room we have for this month. Next month we will look at alternative hook up methods for your favorite data device.

Coming Next Month

Next Month: Part 2 of Interfacing Packet TNC's, etc. to Kenwood Equipment.

If you have a comment about a column, or have a question about any ham radio subject please let us know. We will select topics for the newsletter that have the widest appeal.

73 Craig (KR6T) Craig

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(cont'd from page 3)

the same DWAIT (like the typical 0.1 - 0.5 second values used for terrestrial packet), then everybody will be transmitting at the same time. Part of the key to your success when uplink QRM is heavy is to pick a DWAIT that nobody else is using, sort of like picking a lottery number!

FRACK sets the time interval between your transmissions. After you send a frame, your TNC waits for the FRACK time, and then waits for the carrier detect signal to drop, then waits DWAIT, and then tries again. You should make sure your FRACK is at least 3 seconds so that you are not transmitting when the Robot's FUDtimer decides it is time for it to transmit. If you are transmitting at the same time, you will miss any packets the shuttle is addressing to you and you won't have a successful QSO.

Note that your DWAIT (how soon do I transmit?) and FRACK (then how long do I wait?) parameters and the need to stop transmitting so you can hear a reply are just like you encounter when working a DX pileup on HF. If the DX station has a pattern of listening for a few seconds (=FUDtimer) before transmitting, you may have better luck being the last station he hears, after the din dies down. The differences are that (1) the Robot is a computer and is very predictable and (2) the Robot can be working several stations at one time. Thanks W3IWI via AMSAT News Service.

Source: Westlink Report : 9/14/90

(cont'd from page 5)

- Maildrop support for PK-88, PK-232 w/ Maildrop. Supports offline message receipt without special maildrop upgrade for PK-232.

- Direct Terminal Mode Available: You can easily talk "direct" to your TNC using the direct terminal mode. Useful for following the AEA manual, learning about the TNC operation, and learning how the Packet-PLUS mode of operation makes Packet Radio truly enjoyable.

- Integrated Setup and parameter editor.

- Adjustable Split screen with Zoom function

You may set up your Session (Connect) and Previous session screen with from 0 to 24 lines of monitored network frames.

- Function keys indicated on bottom line.

All function key selections are shown on screen. Pressing the Ctrl or Alt key changes the selections to reflect the Ctrl and Alt functions.

- Quick "jump to session"

Ctrl-F1 through Ctrl-F10 can be used to jump to any current session.

- Binary filter, Alt-B.

While monitoring, all "binary" frames can be filtered from the monitor screen -- you see only the QSOs.

- Editing of text entry line.

You may now use the arrow keys, and the insert function to modify the text entry line.

- Effective Baud rate information allows you to optimize file transfer speed.

- Save session text by Station Callsign.

If desired all QSO text is stored in a seperate file by callsign (packet) or by mode (non-packet operation) in the MONITOR directory.

- Brag file support

Any file ending with .BRG and residing in the same directory as the PKTGOLD.EXE file can be sent using a single function key, Alt-F6.

- Enhanced Clipboard editor

You can use the Find function (F9) to look for text, then turn on the Text Operation to highlight and grab text. Once in the clipboard, you can use the editor to alter it, and save it once edited, or add other files to the clipboard using Alt-R (read). Use the help function in the clipboard editor for more information.

- Maildrop support Built-in.

- Abort startup

If you wish to abort the startup sequence, you no longer have to wait for the program to determine that no TNC is hooked up, or that some other known problem exists. You may abort the initialization process by hitting the F10 key (it's shown on the initialization screen).

- Added PK-232 Multimode support functions

- Signal Analysis key SIAM (Signal Analysis Mode) - On screen indication of Baud rate, Normal/inverted, Wide/Narrow - Baud up/down key, Wide/Narrow shift key - Receive Normal/Inverted key

- Full support for June 1990 PK-88 firmware and July 1990 PK-232MBX

Packet-GOLD is available now for $59.95 (CA residents add 6.5% tax) from:
InterFlex Systems Design P.O. Box 6418
Laguna Niguel, CA 92607
(714) 496-6639 ☐

(cont'd from page 27)

at (800-525-3019 or 503-629-7576) from a touch tone phone. It doesn't have to be from the Fax machine. You'll be greeted by a computer that will prompt you for the information you're looking for. After selecting the appropriate catalogs or data sheets, you will type in your Fax's phone number and hang up. A few minutes later, the Fax will ring and start receiving the information you requested.

Conclusion

If you chose to install a coprocessor, you will have a real "number cruncher" ready to generate copious amounts satellite telemetry in the blink of an eye. As you can see from the chart, coprocessors are moderately priced. Whether they're worth the money depends on what you will be doing with your PC. A PC running a terminal emulation program full time does not need a coprocessor. However, in my opinion, a well equipped general purpose PC should have one.

Please keep in touch with topic ideas as well as questions and comments. ☐

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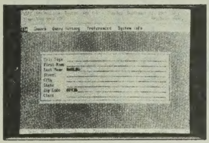

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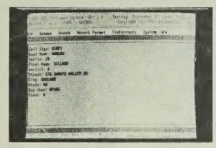

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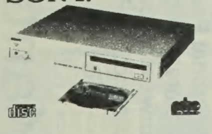

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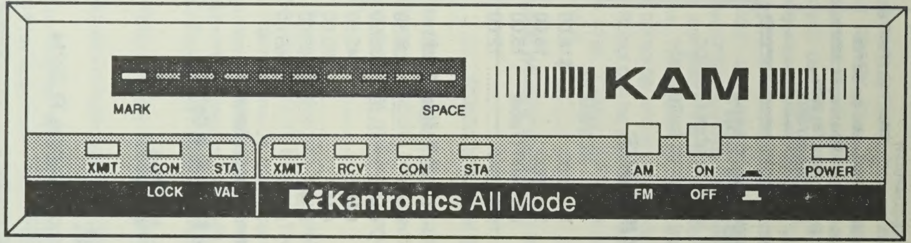

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- **AMTOR** – Preprogrammed 170, 425, and 850 Hz shifts, plus user definable shift (mark and space tones). AMTOR 625 provides for 7 character or 9 digit selcals, relinking, and compatibility with 4 character operation (476)
- **NAVTEX / AMTEX** – Using NAVTEX mode you can copy the ARRL bulletins of your choice, using the AMTEX format.
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Aries-1

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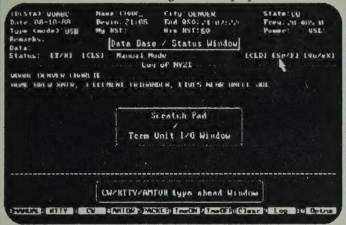

```
ID(Sta):W0ABC      Name:CHAR_      City:DENVER          State:CO
Date:08-10-88      Begin:21:05     End QSO:21:02:22     Freq:20 405.0
Type (mode):USB    My RST:         His RST:59           Power:     QSL:
Remarks:
Data:                 Data Base / Status Window
Status:  [T/R]  [CLS]  Manual Mode             [CLD] [Sr/F] [Qu/eX]
                        Log of NY21
W0ABC DENVER CHARLIE
HOME BREW XMTR, 3 ELEMENT TRIBANDER, LIVES NEAR UNCLE JOE

                       Scratch Pad
                            /
                   Term Unit I/O Window

                CW/RTTY/AMTOR type ahead Window
1MANUAL 2RTTY 3 CW 4AMTOR 5PACKET 6TxeON 7TxeOFF 8Clear 9 Log 10 Optns
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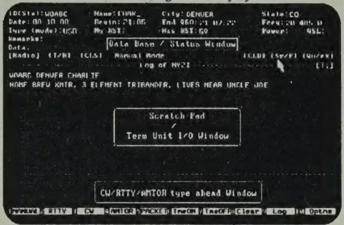
> User defineable colors for all foreground / background
> Dupe checking and logging during digital QSOs
> Shifts TU modes, Baud Rates, CW speed etc. and all other necessary internal parameters with mouse click or key press

Aries-2

Amateur radio Integrated entry System



```
ID(Sta):W0ABC      Name:CHAR_      City:DENVER          State:CO
Date:08 10 88      Begin:21:05     End QSO:21 02:22     Freq:20 405.0
Type (mode):USB    My RST:         His RST:59           Power:     QSL:
Remarks:
Data.                 Data Base / Status Window
[Radio]  [T/R]  [CLS]  Manual Mode             [CLD] [Sr/F] [Qu/eX]
                        Log of NY21                            [T]
W0ABC DENVER CHARLIE
HOME BREW XMTR, 3 ELEMENT TRIBANDER, LIVES NEAR UNCLE JOE

                       Scratch Pad
                            /
                   Term Unit I/O Window

                CW/RTTY/AMTOR type ahead Window
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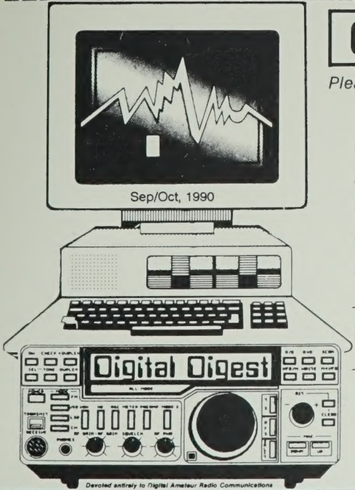

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The IC-229A measures just 5.5"W x 1.6"H x 4.1"D. The IC-229H and IC-449H measure only two inches deeper. Now that's small!

The IC-229A/H is available in both 25W and 50W versions and transmits 140-150MHz, receiving 136-174MHz. The IC-449H covers 440-450MHz and packs 35 watts of peak output power. So much power, you'll feel like you're using a base station!

Both units feature 20 memory channels and one call channel. Each memory stores operating offset and subaudible tone frequencies plus duplex shift direction. Auto dialing is simple with ICOM's new HM-56 microphone. Transmit up to 22-digit telephone numbers. It's ideal for autopatching and repeater control while driving safely.

Additional features include: Programmed memory scan, priority watch, memory skip, 7 tuning steps, 20 dB RF attenuator and a memory split function for split frequency operation. That's mobiling in style!

Legendary ICOM quality backed by Four Factory Owned Service Centers. Let's go mobile with ICOM's new action packed 2-meter and 440MHz transceivers!

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All stated specifications are subject to change without notice or obligation. All ICOM radios significantly exceed FCC regulations limiting spurious emissions. 229590

For a brochure on this or any other ICOM product, call our Toll-Free Literature Request Hotline 1-800-999-9877.

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